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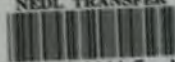
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PURCHASING AND STORING

BY

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*Purchasing Department of the Otis Elevator
Company*

VOLUME 9

FACTORY MANAGEMENT COURSE

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Lincoln B. Campbell

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PREFACE

The provision of raw materials and supplies for a manufacturing establishment is a never-ending process as long as the factory is in active operation. It must commence before the machinery is set in motion and the workman exercises his art in producing the output. Prior to this the purchasing and storing cycle of operations will have been accomplished for the particular article on which the workman is engaged. Just as surely as a machine or tool must travel at a given speed to attain the maximum efficiency, so surely must purchasing and storing proceed in feeding raw materials and supplies to the establishment. Only on such a basis can maximum efficiency be secured.

There is no natural element which is not undergoing a change. Nature is continually at work producing raw materials for manipulation by human effort. If human effort could parallel this endless activity there would be no reason for studying the economic questions raised by the delays in transporting, storing, and handling the product which is to undergo change in the factory.

Some of the most important problems in purchasing and storing are caused by these delays, or rather by the quiescent periods during which the raw material is undergoing no change; for it is during these periods that economic factors are adding to the cost, to such an extent, perhaps, as to sweep aside considerations regarding the actual price at which material can be bought.

Having a manufacturing establishment ready for operation, it is with raw material that real efficiency must begin. It is the purchasing and storekeeping departments which must logically take the first step to effect savings in production. This does not mean that the purchasing agent must spend his energy in beating down prices, and the storekeeper spend his time in accumulating a large stock. The problems go deeper than that. Raw material must be obtained and supplied to the production department at the lowest price for the right material to obtain the maximum output of finished parts, and this must be done with a minimum waste of effort, and a minimum waste of time while the material is at rest.

Good buying and storing are fundamental principles of manufacturing efficiency. The problems connected with the execution of these functions are many, varied, and interesting. I have attempted in the following pages to outline the most approved and tried methods of solving these problems, laying the greatest stress, perhaps, on the acquisition of purchasing knowledge.

I desire here to express my appreciation of the courtesy shown by various manufacturers in allowing me to exhibit their purchasing forms and requisitions.

H. B. TWYFORD.

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PURCHASING AND STORING

CHAPTER I

PRELIMINARY OUTLINE OF PURCHASING

Definition.—Purchasing is one of the commonest of business activities. It means the acquisition of some kind of property and the giving of an accepted price or consideration for that property. The terms purchasing and buying will be considered and used as convertible and synonymous, although there is a disposition by some to regard purchasing as implying a transaction of more dignity and importance.

Every transaction between buyer and seller involving the transfer of property is a contract, and these contracts may take many forms. The simplest form of purchase is one whereby the negotiations are entirely verbal and are conducted simultaneously with the transfer of the article and the consideration. Other forms necessitate the issuing of orders specifying the material, price, and date of delivery; while more complicated forms are made the subject of lengthy written agreements defining minutely in technical terms the nature of the material, methods of payment, and many other factors. In such cases physical possession of the property may not pass to the purchaser until a considerable period after the agreement is made.

Science of Purchasing.—Purchasing is just as much a science as any of the other activities in the great complex structure called business. The success or failure of a commercial undertaking may be the direct result of good or bad buying. The terms good and bad are not used here in a speculative sense. It is not intended to infer that good buying implies simply that one has bought at the lowest market price or that bad buying means that the highest price has been paid. Poor buying means rather that the purchasing has been done promiscuously, loosely, and without foresight and accuracy. Whereas good buying is scientific, and can be checked in many of its phases with the certainty of a mathematical problem.

For the power of purchasing to be at its maximum there must be exact knowledge, which is science; knowledge of materials, which implies some knowledge of manufacturing processes; knowledge of markets and prices; knowledge of sources of supply; knowledge of certain trade customs and usages, and also knowledge of the many ramifications of business transactions into which the exercise of purchasing carries the buyer. Fortunately, much of this can be formulated, tabulated, and recorded in such shape as to be available for instant use.

Economics of Purchasing.—From the inception to the consummation of the transactions between buyer and seller many important economic problems are involved; and the proper handling of these and the administration of the business features connected with them are vital factors in the operation of any commercial undertaking.

Undoubtedly, regulated and right buying is a study in economics. If one glances back over the field of endeavor connected with production and manufacturing and observes its tendencies during the past few decades, it will be noticed that intensive economical operation is applied more closely as time goes on, until a condition exists with many concerns where they save their profits instead of making them, or rather they make their profits by savings. It does not appear that there will be any lessening of this tendency. This country, rich in natural resources, with a nation of born salesmen and advertisers, has heretofore solved the problem of enlarging its profits by making more sales. Conservation of natural resources, competition, shorter hours for workmen with increased pay, and longer week-ends for employers, have forced a realization that an increase of advertising and selling expense will not continue to increase the business in proper proportion to this increase of expense. Hence the necessity for reducing costs. Right buying strikes at the very root of the problem, as its economic value has a vital bearing on the cost of production.

Methods.—It is essential, of course, to create standardized methods of purchasing. These methods have as their object the simplification and assurance of accuracy of the results to be accomplished. The subjugation into mechanical habits of the various processes involved is of the highest possible value. To be a slave to these habits, however, might ultimately react against the object sought. Varying circumstances and conditions will sometimes force one to a

contemplation of a change in policy necessitating a deviation in methods, and this change could not be approached with an open mind if the habits had fastened themselves too closely.

Any change in methods, however, does not change the fundamental principles of purchasing, which are clear and well-defined. These principles have their origin in past experiences and rules laid down by accepted authorities. To question these doctrines is to question their authority. But a mind trained in constructive thinking would not be content to allow the present standards of purchasing to remain in existence indefinitely without attempts at betterment. These attempts will be along the lines of system and methods which must always be flexible enough in their nature to be permitted to adjust themselves to varying situations without in any way detracting from the fundamental principles for which they are intended.

The Purchasing Department.—The instrument through which the buying is done in industrial establishments is the purchasing department; and the evolution and growth of this unit in the industrial organization has been continuous and constantly gaining in importance. The necessity for centralizing, systematizing, and controlling purchases led to the allocation of part or the whole of the time of one man, or of several men, to do the work as conditions demand. The organization of establishments along the lines of departmental formation further resulted in the segregation of these activities, and thereby the purchasing department came into existence.

It is essential that the work of the department be efficiently and expeditiously carried through, for the demands on it grow naturally from the requirements of the business and do not originate with the department itself. The material needs, except actual cash, of every department or section of an establishment should be procured and furnished to them by the purchasing department. For this reason it probably comes into more direct contact and at more frequent intervals with the other departments than any other division of an organization.

Not only in inter-department relations is the purchasing department particularly active, but in its commercial dealings it comes in contact with outside concerns to a greater extent than any other department, except perhaps the sales department—and in many establishments even this exception cannot be made.

In any walk of life, when our material necessities are not promptly and satisfactorily furnished we are apt to criticize those whom we regard as responsible for furnishing them or to whom we look as the source through which we procure them. The conditions referred to in the preceding paragraphs naturally place the purchasing department in a position of vulnerability to complaints and criticism. On this account considerable diplomacy and tact are essential features in purchasing work; and, to confound the critics, efficiency must be the watchword. "We don't know," should never be the answer to questions regarding delivery, to requests for prices, or to queries why invoices have not been approved.

Creative Work.—From what has already been said and from the conditions which are usually supposed to surround purchasing it might be assumed that its function is largely negative. This supposition is mainly caused by the fact that the developments which originate the demand for purchasing are initiated through other departments.

Every business activity, however, must progress to some extent by creative work within its own spheres of influence. Opportunities for this are greater with some activities than with others. The mission of purchasing would not be fulfilled if it did not join in this; it would be stagnant, and progress in the art of buying would be at a standstill.

It has been customary to leave questions affecting the suggestion and utilization of new goods for old purposes or old goods for new purposes to the sales department. This has been natural, because the vocation of a salesman should familiarize him with the market for the products of his factory. But there is the other side of this matter to be considered, and ideal purchasing will mean that it shares with selling in the creation and development referred to. This is possible because men engaged in buying come into touch with markets which the selling force probably never see or hear of. The creative instinct in men engaged in purchasing could not fail to be aroused by new devices, new material, or articles which they might find applicable to the manufactures and products of their own concern. In this way, selling and purchasing will jointly share in the creative work and progressive development.

For the purchasing agent this would be constructive activity of the highest order, and would mean that he would be instrumental in improving and bringing forward goods, not only for his own concern, but for many others. If this seems idealistic to any one he has only to look back over the field of endeavor in any industry or profession and review what has been accomplished and the progress made, and ask himself if this progress has any finality. If it has none, then there is no finality to progressive developments in purchasing. And it is exactly this which will ultimately prove for purchasing its measure of fitness and determine its relation to, and place in, the world of business.

Policy.—The selling department of an organization will make strenuous efforts to establish a reputation, not only for the product it sells, but for its selling policy. This reputation will be assiduously and jealously guarded; and the policy, strictly maintained on the standards adopted, will be considered one of its greatest assets. It is equally essential for a purchasing department to establish for itself a policy based on recognized standards of business morality and ethics.

The value of this will be appreciated in the treatment accorded to the purchasing department in the multifarious dealings and debatable questions which often come up between it and the many concerns with whom it has negotiations and transactions.

The characteristics displayed by a purchasing department will determine its standing in the business community. It is not just a matter of business mor-

als, but of knowledge of business methods and usages. Ignorance of these, intolerance, lack of courtesy, and high-handedness will do more harm to efficient purchasing than plain crass ignorance regarding the material being bought. Vendors are quick to sense these things, and their attitude and actions will be largely based on them.

The acquisition of raw material is the initial step incurred in the cost of manufacturing anything. Equipment and tools of the necessary character must be procured before production work can proceed. Supplies also must be accumulated for use in the operation of the plant. The deduction to be drawn from this is that starting right means buying right.

Six Great Divisions.—The activities of purchasing for an industrial establishment can be classed under six headings. These are the six main divisions, each of which can be subdivided into many minor activities. A diagrammatic survey of the principal ones is given in Figure 1. Reference to this will greatly facilitate a comprehensive grasp of the problem as a whole and some of its minor features and details.

Amplification of these divisions is given in the following brief description:

- I. **THE ARTICLE.** This naturally comes first, because unless there was something to be bought there would be no buying to be done.
 - a. Authentication of the request to purchase.
 - b. Knowledge that it is the article best suited for the intended purpose.
 - c. An accurate definition which will completely preclude the possibility of confusion with any other article.

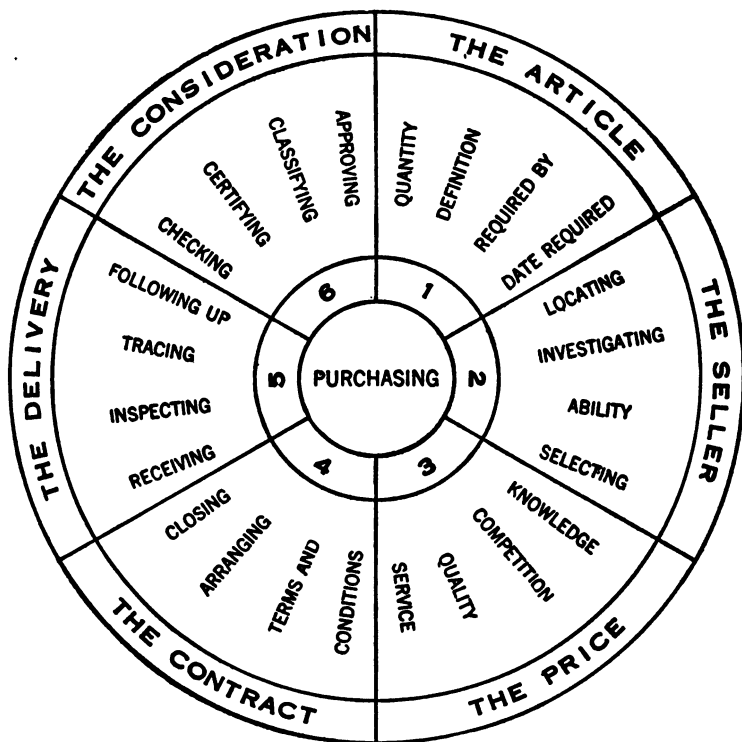


FIGURE 1.—DIAGRAM OF THE SIX GREAT DIVISIONS OF PURCHASING WORK, WITH SOME OF THE SUBDIVISIONS

- d.* A correct specification or description of quality.
- e.* Knowledge of the quantity to be purchased.
- f.* Knowledge of the principal characteristics and the processes through which the article passed prior to arriving at the condition in which it is to be bought.
- g.* The date on which delivery is required.

2. **THE SELLER.** The second stage is to form connections with vendors.
 - a. Locating the best sources from which the particular article can be obtained.
 - b. Elimination of economic losses by avoiding wrong sources of supply.
 - c. Investigation of reliability of seller and methods of doing business.
 - d. Securing assurance of ability to deliver at required date.
 - e. Ascertaining location of shipping point and considering its relation to delivery point with special reference to transportation facilities.
3. **THE PRICE.** Establishing the consideration with the seller.
 - a. Price knowledge.
 - b. Securing competitive quotations.
 - c. Knowledge of how to obtain the best price.
 - d. Consideration of price in its relation to quality and service.
 - e. Knowledge of available quantities and existing demands.
4. **THE CONTRACT.** Issuing the order or making the contract, and agreeing and arranging with the seller the various clauses and stipulations.
 - a. Embodying in the contract the features outlined in above divisions, 1, 2, and 3, as to quantity, quality, and price.
 - b. Arranging f. o. b. point.
 - c. Agreeing as to payment of freight or delivery charges.
 - d. Arranging terms and method of payment.
 - e. Securing best cash discount.
 - f. Reviewing legal aspects of contract.
5. **THE DELIVERY.** Securing physical possession of the property.
 - a. Institution of a follow-up system.

- b.* Keeping the seller up to the terms of contract.
 - c.* Inspecting material in course of manufacture or as shipped.
 - d.* Recording shipments or deliveries made.
 - e.* Keeping track of shipments in hands of transportation companies.
 - f.* Following up and tracing shipments.
 - g.* Final receipt of goods at destination.
6. **THE CONSIDERATION.** In-so-far as the purchasing department is concerned this means approving the invoice and seeing that it is in proper shape for payment.
- a.* Checking with contract for quantity.
 - b.* Approving price.
 - c.* Seeing that terms and cash discounts are correctly stated in the invoice.
 - d.* Checking extensions and calculations on the invoice.
 - e.* Securing certification of receipt of goods.
 - f.* Properly classifying the charge.
 - g.* Finally approving for payment.

The knowledge element and mechanical aids essential to a systematic study and understanding of the six great factors in purchasing will be dealt with fully in proper sequence in later chapters.

It is necessary for any student of this function of business to get a comprehensive grasp of the fundamentals outlined. It will then be much easier to assimilate the minor problems in connection with them as they arise for discussion.

Corelation of the Divisions.—Purchasing can only be conducted at the highest percentage of efficiency when each of the fundamentals receives proper attention. A chain is as strong as its weakest link, and this axiom can be applied with unusual force to the

links in purchasing. If material is incorrectly or inadequately specified or defined, the price obtained might be useless, or at least subject, to revision. If the order is not accurately worded, the wrong material may be delivered. If the material is correctly specified, the lowest price obtained, and the order issued to the firm best suited to supply it, still all these advantages might be nullified if delivery were not made as required. Lastly, assuming that all phases of the transaction have been taken care of in an adequate manner down to the receipt of the invoice and this is allowed to go through for payment not in accordance with the agreed price or terms, all the economic benefits secured by the good work done up to this point might be lost. This emphasizes the interdependence of each section of the work; and no one part of it can be overlooked, relegated to the background, or treated as negligible.

Simply placing orders is but a small part of the work and cannot rank as purchasing. What it is desired to emphasize is that there is a well-defined beginning and a logical conclusion to purchasing, and all the intermediate activities between those points must be carried through on a basis of equal efficiency to insure the successful operation of this department of business.

The purchasing agent is responsible up to the time the material arrives. Unless it is delivered to the plant within a given time determined by the production department, the whole scheme of economical shop operation is jeopardized. Not only this, but it might entail delays in filling contracts entered into by the

sales department, involving the contingencies of the loss of customers' good will and the possibility of being mulcted for penalties on account of non-delivery.

There is a triangle of expenditures that go to make up the cost of any manufactured product; this triangle is composed of material—labor—overhead charges. The last named is frequently determined by conditions and location. Trading and bargaining with labor is strictly limited. Neither of the two mentioned can be bought when the market is low and stored for future use. The other leg of the triangle—material—is most susceptible to control through good judgment, foresight, and selective ability. For these reasons the importance of purchasing is being increasingly recognized.

CHAPTER II

THE ARTICLE

Specifications and Definitions.—In making the divisions of purchasing, as shown in the previous chapter, the premier place was given to the “article,” or the material to be purchased. The reason for this is obvious, since it is apparent that unless one knows what is to be bought, purchasing could not proceed. By placing it first, however, it is not intended to give it undue importance over any other phase of the work. To specify means to be explicit; to be definite; to describe accurately. This subject of correct specifications is of great importance, and, in many respects, it may be said to be the most important thing in purchasing.

Appropriate to this subject is the following quotation from the Report of The Bureau of Supplies of New York City:

Nothing should be left to the imagination in the writing of specifications. If the man desiring an article purchased or a piece of work done knows what he wants, let him describe it in straight, clean-cut, unmistakable language. This takes more time, but it is worth it. Adjectives and adverbs are particularly objectionable. To say that work must be done “properly,” or “suitably,” or in a “workmanlike manner” does not really mean anything, because what one man will consider “proper” or “suitable” another man holds to be quite the

contrary. Such expressions cause great uncertainty, they develop confusion, misunderstandings, hard feelings, and delay; and they contain such opportunities for unfairness and graft that they should not be tolerated. The clause that work must be done or supplies delivered "to the satisfaction of the engineer or inspector" causes every prudent contractor to bid high in self defense.

Broadly speaking, from a purchasing standpoint all material can be divided into two classes for specification purposes. One class covers material which it is necessary to describe in detailed technical terms, or which has to pass inspection other than that usually given to incoming material, or which is subject to special tests. The other class covers material for which there are well recognized standard commercial definitions.

Material Specifications.—The first class referred to usually comprises material of a certain grade, quality, or texture pre-determined by the technical staff as most suitable for the product into which it enters. Probably exhaustive and expensive experiments have resulted in the selection of this material, and it is no part of the duties of the purchasing staff to question the specifications. It is their province, however, to buy it, when, and as required, in the quantities requisitioned and get delivery at the stated time.

To enable this to be done there must be in the files of the purchasing department complete detailed specifications. It is not sufficient for these specifications to be held by the engineering or production department and sent to the purchasing department with the requisition for material. Emergencies frequently re-

quire prompt action in purchasing, and to be dependent on some other department for any information requisite to making the purchase means delay.

The technical staff, having prepared the specifications, should have them properly numbered and should retain the master copies, furnishing an ample supply to the other departments interested. The specifications can be printed, if sufficient quantities warrant it, or they can be typewritten or blue printed. The number required for purchasing purposes will depend entirely on how often the material is bought, how many firms are asked to bid on it, and on the number of orders issued. When an order is sent to a vendor for material described in a separate specification, a copy of the specification should accompany the order, distinctly identifying it with the order by inserting a clause reading, "This material to be in accordance with our specification No. —, dated, which is attached to and forms a part of this order."

Even though the firm receiving the order already has a copy of the specifications, which it may have retained when quoting, another copy should nevertheless be sent with the order.

The best method of filing these specifications is in folders similar to correspondence folders, although the extension or bellows type may be necessary where large numbers are kept. Card indexing them, as shown in Figure 2, will make them available for rapid reference and of immediate use for mailing. Notations should always be kept of all revisions. The identification of these revisions by dates or by pre-

MATERIAL _____	
Specification No. _____	Folder No. _____
Original Date _____	
Revision Dates _____	
Also refer to _____	

FIG. 2. INDEX CARD FOR SPECIFICATIONS

In starting a new set of specifications it is possible to have the specification and folder number correspond

fixing a letter to the number is the duty of the technical staff, and can be done in much the same manner as revisions on tracings.

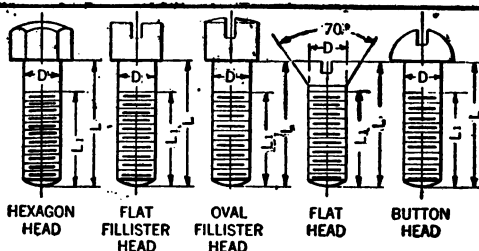
It is sometimes necessary to send out blue prints or sketches to bidders and with orders. It is not suggested that copies of these be kept in the purchasing department. The technical department, having charge of the original drawings and tracings, should be able to furnish prints promptly; but it is essential that such sketches be identified with the order in a manner similar to that suggested for the specifications.

Equipment Specifications.—Establishments of sufficient magnitude have a competent man or department to take entire charge of equipment, and usually this man or department is responsible for keeping a complete record of all machine tools, shop equipment, and plant, including engines, boilers, dynamos, inside and

outside cranes, etc. It is part of his duties to keep a record of these and to be able to furnish to the purchasing department a complete description of any part that it may be necessary to buy.

It is not conjecture, for experience has proven, to state that a great many plants keep no records, or at best very incomplete records, of their equipment. In such concerns when a breakdown occurs and it becomes necessary to procure parts quickly, the efforts to do so involve a great waste of time, much correspondence, and even at times finally shipping the broken parts to the manufacturer when all other attempts to identify or describe the requirements have failed. In factories where such conditions exist the purchasing department can render an exceptional service by keeping a record of all equipment purchased. It can obtain from the manufacturers a complete specification of the machine, with illustrations or prints, with the invoice. These can be filed in a similar manner to the material specifications. Although it is scarcely the province of the purchasing department to keep a card system of plant and machine tool records, yet, in the absence of complete records in any department, it can certainly render good service if it keeps track of its purchases of these items.

Coal Specifications.—Other specifications which could well be handled in the same manner as the material specifications are those for coal, oil, and paints, if bought in sufficiently large quantities. Coal should always be bought on a B. t. u. basis, with some limits specified, probably, as to the percentage of



CAP SCREWS

DEFINITION:

Cap screws are milled from bars slightly larger than the size of finished head. Heads are true with the body. Cap screws are finished all over. Threaded portion equals three-quarters of the length of screw up to and including 4" in length; over 4" long threaded portion equals one-half the length. If special length of thread is required, same is to be furnished per drawings or specifications. Special length of thread to be specified only where standard cannot be used.

Cap screws vary in length by quarter inch from $\frac{1}{4}$ " to 5" long inclusive and by half inch from 5 $\frac{1}{2}$ " up, although seldom used over 5" long. These are standard variations and must be used wherever possible.

For dimensions for heads of cap screws see table "Dimensions of Cap Screw Heads," #5204 Data Class.

Hexagon head cap screws are not to be used when a regular hexagon head tap bolt will answer the purpose.

Cap screws when made of machinery steel must have a tensile strength of not less than 50,000 pounds per square inch.

Cap screws with Flat fillister, Oval fillister, Flat or Button heads are not to be used in sizes of $\frac{1}{4}$ " or less. If this style head is required in sizes of $\frac{1}{4}$ " or less, use Machine Screws.

For lists of cap screws giving Part Numbers, see:

#1189	Table Class for Flat fillister head
1190	" " " Flat head
1191	" " " Oval fillister head
1192	" " " Button head
1193	" " " Hexagon head

SPECIFICATIONS FOR PURCHASE ORDERS AND STOCK LEDGER SHEETS.

Quantity, Diam. x Length	<table border="0"> <tr> <td>{</td> <td>Hexagon</td> <td rowspan="5">} Head Cap Screws threaded U. S. S.</td> </tr> <tr> <td>{</td> <td>Flat fillister</td> </tr> <tr> <td>{</td> <td>Oval fillister</td> </tr> <tr> <td>{</td> <td>Flat</td> </tr> <tr> <td>{</td> <td>Button</td> </tr> </table>	{	Hexagon	} Head Cap Screws threaded U. S. S.	{	Flat fillister	{	Oval fillister	{	Flat	{	Button
{	Hexagon	} Head Cap Screws threaded U. S. S.										
{	Flat fillister											
{	Oval fillister											
{	Flat											
{	Button											

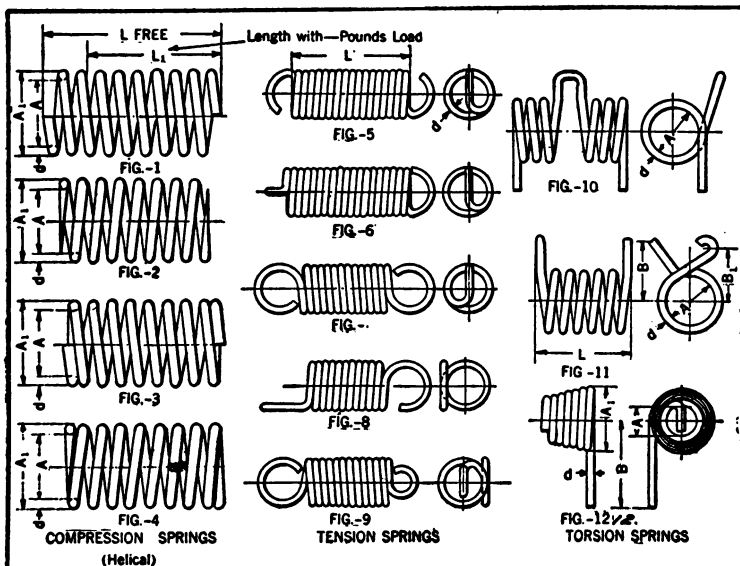
Example: 25— $\frac{1}{4}$ " x 4" hex. head cap screws, threaded U. S. S.
(If special length of thread is required, specify the length in inches).

FIG. 3. STANDARD DESCRIPTIONS AND DEFINITIONS

sulphur, volatile matter, and ash. Each car load of coal bought on this basis should be sampled and analyzed. This can be done for a few cents a ton, and the premium may be paid or penalty deducted on the analytical results. There is now no difficulty in getting coal merchants to sell on these conditions.

In spite of this fact, there are as yet very few industrial plants buying coal on the basis of calorific value. It is a common practice to buy it on the reputation of the mine. But would one buy gold, silver, or iron ore because it was mined in a certain district? Certainly one would have it assayed. The process of determining the value of coal is not complicated or expensive; hence, considering the enormous consumption, it is only natural and fair that consumers should insist on payment being made on the results of analytical tests.

Moreover, when coal is bought on the assumption that it is good because it is from a mine with an established reputation, it is difficult to take advantage of competition. In fact, there can be no real competition under such conditions. Each dealer will claim his coal is equal or superior to some other; but statements of this character have no foundation in fact unless proven, and the only proof is the consumer's analytical test. It is essential to determine also the size of coal best suited for the particular style of grate bars used in the construction of the boilers; or, if mechanical stokers are used, the speed of these and their method of operation may influence a decision as to size of coal. The customary method of defining size of coal as buckwheat, pea, nut, etc.,



SPRINGS

DEFINITION:

In machine construction those members that are to yieldingly resist force and regain their original position or shape at the removal of the force are called springs.

They are made in an endless variety of forms and are used for many distinct classes of service.

Broadly speaking they may be divided into the following classes, which indicate their use or function—Compression, Tension and Torsion.

Several forms of springs are shown above, also the general method of dimensioning that should be followed on all drawings.

In dimensioning or specifying springs, the following information must always be given.

Compression Springs (Helical)

- 1st. Give the outside diameter or inside diameter depending upon which is the most important. If the spring is to be placed in a pocket, the outside diameter would be of the most importance, and if it is to fit over a spindle or similar part, the inside diameter would be of the most importance.

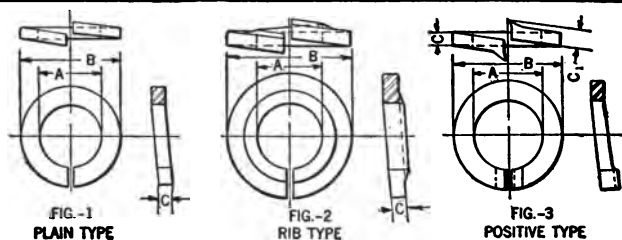
FIG. 4. STANDARD DESCRIPTIONS AND DEFINITIONS

must sooner or later disappear, and dimensional sizes will be specified. In European countries this change has already taken place, and contracts can be placed containing a clause specifying the size of mesh of a screen over which the coal shall pass and the size of mesh through which it shall fall, with a stipulated percentage of coal smaller than the screen it passes over to cover breakage in handling.

Standard Commercial Definitions.—The other class of material referred to in the opening of this chapter includes material for which there are standard or well-recognized trade definitions. In industrial establishments the orders issued for such material are usually far more numerous than for any other class of material, and include orders for small tools and nearly all supplies.

Probably more trouble is experienced by the purchasing department in dealing with these purchases than with any others, and this trouble is caused solely by incorrect, improper, inaccurate, or incomplete descriptions, which may arise from the fact that varying methods of defining an article are used by different departments and individuals. This leads to confusion, and compels the purchasing department to refer back to the storekeeper or to some other individual who drew up the requisition. Delay and expense are thereby entailed, besides other annoyances.

The existence of this condition is demoralizing to the internal economic administration of an establishment. Not only is an inordinate amount of time consumed in getting requisitions into shape for price getting and ordering, but delays occur in placing



LOCK WASHERS

DEFINITION:

The term "Lock Washer" shall be understood as indicating a part or member of an apparatus placed under the head of a bolt or under a nut to prevent a nut, from unscrewing from a bolt, or to prevent a bolt from unscrewing from a tapped hole.

The most commonly used form is the spring lock washer. They are made in a variety of forms, three (3) of the principle types are shown above and are known as Plain type—Fig. #1; Rib type—Fig. #2 and Positive type—Fig. #3.

The Plain type will be supplied unless otherwise specified. The use of the Positive type should be avoided wherever the nut or bolt is subjected to removal and replacement as the sharp points at the end of washer defaces the underside of nut or bolt head.

The material used in the manufacture of spring lock washers is steel.

In specifying standard lock washers, state bolt diameter, and also type, if other than Plain type is wanted.

For dimensions of standard lock washers, see table "Dimensions of Standard Lock Washers" #5213 Data Class.

In specifying lock washers, other than standard as given on table #5213 Data Class, state bolt diameter, type and section of steel.

For list of standard lock washers giving Part Numbers, see #1265 Table Class.

SPECIFICATIONS FOR PURCHASE ORDERS AND STOCK LEDGER SHEETS.

Quantity, Bolt Diam., Name of Part, Type, Size of Steel.

Example: 500— $\frac{1}{4}$ " lock washers, plain type, 5/32" x 3/32" steel.

SPECIFICATIONS FOR STOCK OR SHOP LISTS AND REQUISITIONS.

Quantity, Bolt Diam., Name of Part, Type.

Example: 50— $\frac{1}{4}$ " lock washers, plain type.

SPECIFICATIONS FOR DRAWINGS AND ENGINEERING PART LISTS.

Quantity, Bolt Diam., Name of Part, Material, Type, Part Number.

Example: 50— $\frac{1}{4}$ " lock washers, steel, plain type, Part No. 7374.

FIG. 5. STANDARD DESCRIPTIONS AND DEFINITIONS

orders which, in the case of a "rush" requisition for some emergency, might involve serious results.

The purchasing department cannot afford to let these inadequate definitions get past it. If requests for quotations or orders carry an ambiguous meaning and are sent to suppliers and vendors, the trouble is sown broadcast among them, and will cause further losses and delays. Quotations received from them could not be considered absolutely reliable for comparative purposes, and wrong material, even, might be shipped simply because the order was worded in such a way that it could be read to mean more than one grade, or style, or quality.

Unfortunately, this condition is prevalent to a degree little imagined by those not engaged in purchasing work, and its influence on the economics of business is far reaching. But this phase of the matter will be discussed in another chapter and the present discussion limited to suggestions and methods for elucidating and solving the problem of correct definitions.

Examples of Improper Descriptions.—A better understanding of this problem can be gathered by taking a few specific instances which have arisen in the writer's personal experience.

A requisition was received reading:

12 Gross Hack Saws.

Of course, hack saws are made in any number of sizes for a large variety of purposes. What was actually required was twelve gross of fourteen inch hack saws, fourteen teeth to the inch, for power

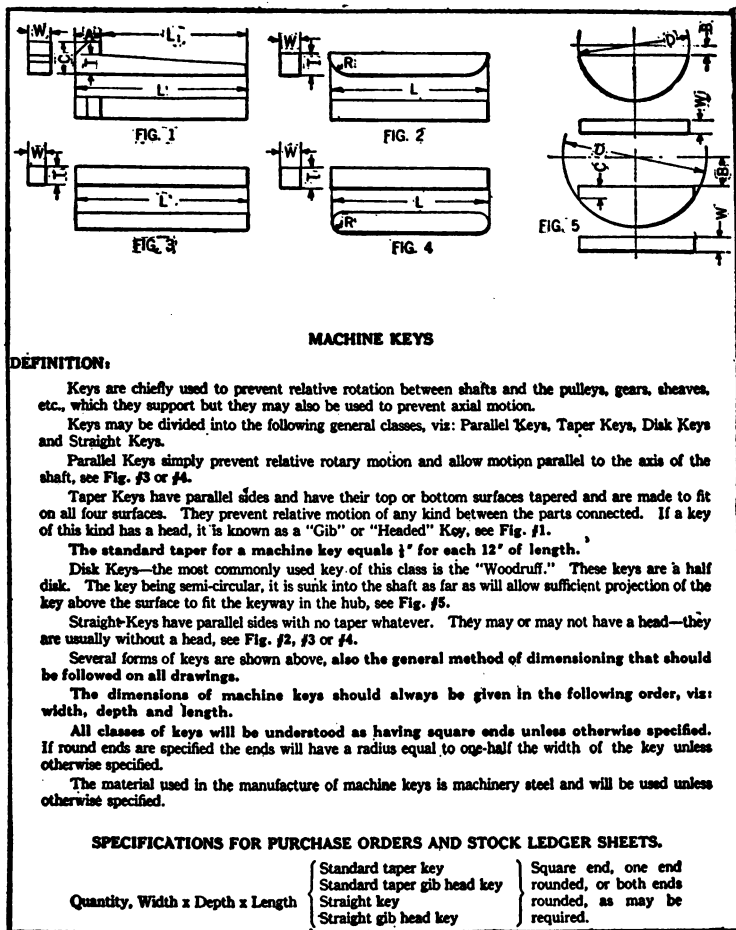


FIG. 6. STANDARD DESCRIPTIONS AND DEFINITIONS

machines. No intelligent prices could have been obtained or an order issued on the basis of the definition given in the requisition.

Another requisition was for:

10,000 Bolts and Nuts $\frac{3}{4}$ "x3".

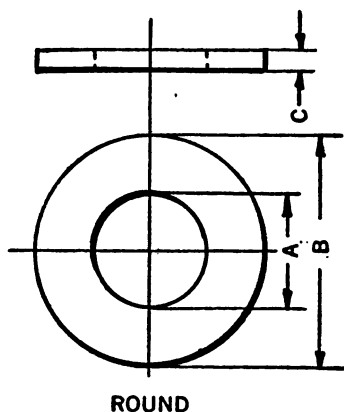
In this case neither the style of the bolt nor of the nut is specified. The nuts might be square or hexagon, hot pressed or cold punched. If bids were asked on the description given, the bidders would immediately ask what was actually required, or would send in quotations for varying styles of nuts and the prices would be useless for purposes of comparison. The correct method of specifying and which should have been employed in writing requisitions is as follows:

10,000— $\frac{3}{4}$ "x3" sq. head Machine Bolts with C. P. R. hex nuts., U. S. S.

This description would be readily understood by any manufacturer of bolts and nuts. Its import is unmistakable to any person accustomed to handling this material. If one wanted to be technical, the specification could be extended as follows: To be made of machinery steel having a tensile strength of 50,000 pounds per square inch; and the nuts could be further described as cold punched, chamfered and trimmed hexagon rough nuts. But the definition as given above is the regular commercial one and is ample for all ordinary purposes.

Another illustration is of a requisition which read:

1 Bale of Burlap for packing room.



ROUND COPPER WASHERS

Part No.	Bolt Diam.	A	B	C	Remarks
85304	#4	.125"	$\frac{1}{16}$ "	$\frac{1}{16}$ "	Standard
84761		$\frac{1}{16}$ "	$\frac{1}{8}$ "	$\frac{1}{16}$ "	Special
80182		$\frac{1}{16}$ "	$\frac{1}{8}$ "	$\frac{1}{16}$ "	"
86095	#6	.150"	$\frac{1}{8}$ "	$\frac{1}{16}$ "	Standard
80490		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Special
80007		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"
80148		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"
84762		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Sp. for "L" Push Button
84764	#8	.170"	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Standard
80489		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Special
80149	#10	.195"	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Standard
80150		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Special
1867		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Contact disk, hole C's'k.
80158		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Special
80147		.215"	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"
85307	#12	.228"	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Standard
80185		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Contact Disk
80151		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	Special
80152		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"
80153		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"
80154		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"
80155		$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{1}{16}$ "	"

FIG. 7. A STANDARD METHOD OF INDICATING THE PART NUMBER
 In this way the production department is able to requisition articles simply by giving the part number. The purchasing department will clearly understand what is to be purchased.

If a purchasing agent asked for prices on such a definition he would be requested for information as to weight per foot and width. This is one of those instances where practical experience should determine the quality best suited for the product that is packed in the shipping room. It is possible that it may be found more economical to carry two or more weights in stock. In any case the width of the roll and the weight per yard should be specified.

The illustrations given could be continued indefinitely, but those given will answer the present purpose. It cannot be emphasized too strongly that for intelligent purchasing every article and all material must be accurately and adequately described. In doing this it is preferable that definitions be brief, concise, and tersely worded. Sometimes one or two words and figures are sufficient. Nothing is gained by adding anything to the shortest definition, providing this definition conveys in unmistakable language what is actually meant. No article is so simple or so common that it should not be properly and clearly described or specified.

Confusion is further aggravated by the varying methods of describing the same article. One man may give the width first and the length next, while another will reverse this order. Again, the addition of a single unnecessary word might lead to a complete misunderstanding, while, on the other hand, the omission of one might even mean that the description could be used to cover two articles.

Purposes of Definitions.—The subject of standard definitions has had the serious consideration of many

DEFINITION OF PARTS

BASE—A part used as a foundation, rest or support for another part or parts.

Apply a prefix to the term indicating location.

Specification should state: Quantity, Name of Part, Material, Part Number.

- Example: 6—contact holder bases, Brass, Part No. 3337.
1—equalizing hitch base, C. I., Part No. 6634.

BEAM—A part long in proportion to its thickness, usually in a horizontal or nearly horizontal position and supported at its end or ends and loaded in some manner; as a load in the center, load at either end, or both ends, an equally distributed load, etc. This term should be used with discretion and avoided wherever possible.

Apply a prefix to the term indicating function.

Specification should state: Quantity, Name of Part, Material, Part Number.

- Example: 1—momentum compound brake working beam, C. S., Part No. 5535.

BEARING—A part used as a support for and in direct contact with a moving part. The moving part is usually a revolving one, as a shaft journal, pivot, pin, etc. or it may be a part subject to longitudinal motion.

Bearings for revolving parts should be divided into three classes viz, those in which the pressure is perpendicular to the axis of the shaft, the pivot or step bearing in which the pressure is parallel to the axis of the shaft, and the thrust bearing in which the pressure is parallel with the axis of the shaft, but is taken on the face of a collar or other form of bearing from the periphery of the shaft.

The last two classes will be treated under their proper headings, viz, "Pivot Bearings" and "Thrust Bearings".

Apply a prefix to the term indicating location.

Specification should state: Quantity, Name of Part, Material, Part Number.

- Example: 1—drum shaft bearing, C. I., Part No. 3126
2—inside worm shaft bearings, C. I., Part No. 6231.

BED—A foundation for a machine. A rigid part of a machine on which something is supported and to which the working parts are usually secured.

Avoid the use of this term, using instead the term "Bed Plate."

BED PLATE—A rigid part of a machine on which something is supported, and to which the working parts are usually secured.

Specification should state: Quantity, Name of Part, Material, Part Number, as possible, stating: Quantity

bevel gears where the plane. The term "M" the term "Bevel Gear" to bevel gears whose

Specify bevel gears Quantity, Name of Pitch diameter, Material

- Example: 1—bevel No. 88

BLOCK—A term used to a part more or less of more plane or surface be used with disc also "Pillow Block." Apply a prefix to the

Specification should Part Number.

- Example: 1—#2 "S" No. 14
4—guide shaft
1—thimble

BLOWOUT—A magnet formed by the separating part of a circuit function.

Specification should Part Number.

- Example: 1—"C D" Part 1
2—"H K" Part 1

BOILER—This term has As used by this Commission strong metallic vessel

BOLT—A strong pin of head at one end and a screw thread at the are given various names the general shape of the Commercial bolts are follows: Brass bolts and nuts...

FIG. 8. DEFINITION SHEET

These sheets are extremely valuable throughout any establishment. The object is to give clear definitions which may be understood by anyone. See also Figure 9.

manufacturers, and earnest efforts have been made to find a satisfactory solution. Various schemes have been tried out with varying success. That it is essential to have some regulated and well ordered method of standardizing the descriptions of every class of material and of all articles, and also of all supplies of every kind and nature used around an industrial plant, can not be gainsaid. There have been more attempts to standardize material and supplies than to standardize the use of proper definitions. The purchasing department is more directly interested in the latter phase. Both phases, unquestionably, should be dealt with simultaneously, but it is not always done.

The objects to be attained by standardization are:

1. To indicate commercial material and articles to be used in production work and to be adopted as standard.
2. To reduce the variety of material and articles necessary to be carried in stock.
3. To reduce the variety of supplies used and consumed throughout the establishment.
4. To secure uniformity in naming and defining all material, articles, and supplies.

The illustrations shown in Figures 3 to 10 indicate in what manner the objects mentioned have been attained. These sheets of definitions can be printed if there is a large number of users or can be prepared by the technical staff and blue printed if there is only a limited number of users.

DEFINITION OF PARTS

KEY—For the definition of this term, also method or specifying, see #5022 Data Class.

KNEE—This term will be understood as indicating a bracket which connects two parts at an angle.
The use of this term should be avoided wherever possible, using instead the terms bracket, etc.
Apply a prefix to the term indicating location or function.

Specification should state: Quantity, Name of Part, Material, Part Number.

Example: 1—brake band knee, W. I., Part No. 17751.

KNUCKLE JOINT—This term will be understood as indicating a hinge joint, in which a projection with an eye on one piece, enters a jaw between two corresponding projections with eyes on another piece, and is retained by a pin which passes through the eyes and forms the pivot.

LAMINATION—Used as an electrical term it will be understood as indicating a thin iron disk or plate used to build up an armature, field pole pieces, etc.
The thin disks or plates may or may not be insulated from one another.
Apply a prefix to the term indicating function or location.

Specification should state: Quantity, Name of Part, Material, Part Number.

Example: 300—#17-26 Motor pole piece laminations, Steel, #28 (.0156") U. S. Gauge, Part No. 30001.

LATCH—A movable piece which holds anything in place by entering a notch or cavity.
The use of this term should be avoided wherever possible, using instead the terms "Catch," etc.
Apply a prefix to the term indicating location.

Specification should state: Quantity, Name of Part, Material, Part Number.

Example: 1—switch arm latch, C. S., Part No. 17756.

LEVER—A rigid piece which is capable of turning about one point, or axis, and in which are two or more other points where forces are applied or delivered; used for transmitting and modifying force and motion.
Apply a prefix to the term indicating location or function.

LINK—This term is used for a rod or piece for connecting rod with be used to indicate. The term is also used for escalator, the part also has a rack and pinion. Apply a prefix to the term indicating location or function.

Specification should state: Part Number.

Example: 1—main link
1—opposite link
1—link pin

LOCKNUT—This term is used in pipe fitting where a pipe passes through a liquid; such as a nut is cut on the pipe. Two locknuts are used on the outside of the pipe. The side of the tap between the locknuts to make an absolute check nut. The term "Locknut" is a check nut.

LOCK WASHER—A part or member or under a nut, or to prevent a nut from loosening. For further information specifying, see For dimensions For list of sizes #1205 Table C

LOOM BOLT—A bolt of the body neck to fasten wood, very similar to a larger, and the same. Avoid the use of it.

LUG—This term is used for anything is supported is fastened. Any part The use of this term

FIG. 9. DEFINITION SHEET

These sheets familiarize the staff with various parts, and are of great value to those in the technical departments and of far greater value to those without technical training.

See also Figure 8.

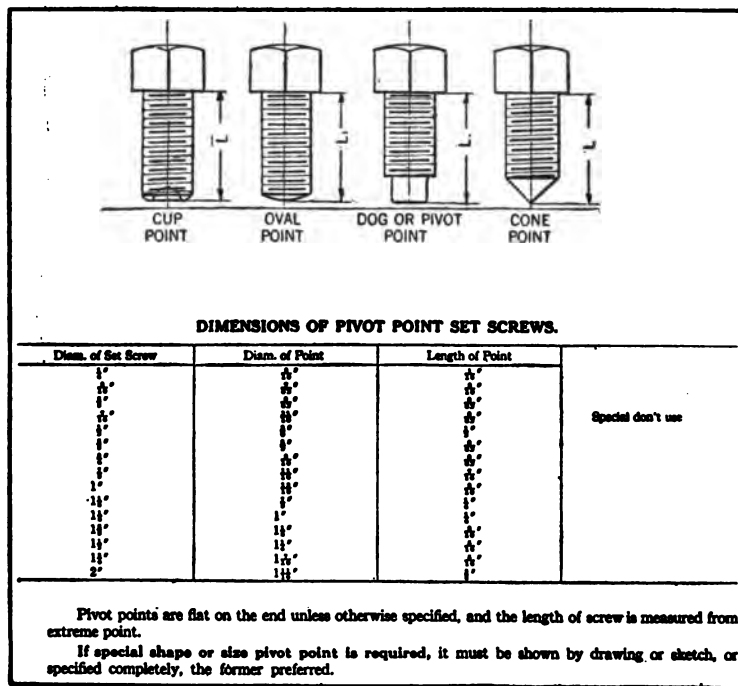


FIG. 10. TABULATION OF STANDARD DIMENSIONS

Speaking again from the viewpoint of purchasing, there is one objection to these sheets or books of standard definitions. Every person authorized to make requisitions on the purchasing department is supposed to have a copy and adhere rigidly to the standards adopted for naming and defining the goods requisitioned. But, unfortunately, this is not always done. The books are apt to be treated as reference books, purely and simply, to be consulted when in doubt. Confident in his memory many a man will admit no doubt even when not pressed for time, and

will write up a requisition incorrectly or inadequately. And when in a hurry, although in doubt, he will perhaps not consult his reference book, trusting to the purchasing department to rectify any errors of omission and commission.

Therefore, the purchasing department cannot escape from the responsibility of correctly and adequately defining its purchases. It must check up all requisitions before any action is taken on them.

Standardizing Definitions Through Purchasing.—In those establishments where no methods have been adopted for securing standard definitions it devolves upon the purchasing department to do something in this direction, and large results can be accomplished if the problem is approached in the right manner and grappled with in a systematic way.

Constantly coming in contact with manufacturers and vendors, the purchasing staff is in a peculiarly favorable position to become conversant with the regular recognized standard commercial definitions of everything purchased, and it can gradually enforce the use of them in so far as the purchasing and store-keeping departments are concerned.

It may be contended that it is not the province of the purchasing department to attempt to enforce the standardization of materials, but it has been known to have accomplished much good in this direction.

In the enforcement of a standard line of supplies it can well have a freer hand. In those cases where each department or section of an establishment requisitions its own supplies, it is liable to be governed by individual preferences and dislikes, causing

a much greater variety of articles to be purchased than is absolutely necessary. Elimination of this fault can be brought about by standardization. A purchasing agent recently said that he found eighteen varieties of cotton waste were being used in an establishment when he took charge of the purchasing; sixteen of these he soon found were unwarranted. This condition occurred in a manufacturing plant, not in municipal purchasing. As a result a saving in cost of forty-five per cent was effected.

The average buyer is commercially rather than technically trained; and it is not to be assumed that a man with these qualifications, buying a wide variety of articles, can be so technically informed that he is able to specify each one of his purchases accurately. Nevertheless, he should have some superficial knowledge of technical and mechanical subjects. Generally speaking, the man who buys a specified grade of material in large quantities at regular intervals should not suffer from a lack of knowledge concerning the technical characteristics of that material. He will, from observation if not sheer necessity, acquire all points of information needful to the satisfactory and economic purchase of the commodity.

Similar deductions can be made in connection with the purchase of supplies, and perhaps they apply with more force because technical considerations are not so important nor so intricate. The uniformity of the product of an industrial establishment depends very largely on uniformity in the quality of raw materials. With supplies it is somewhat different. Utilitarian considerations have more weight in de-


				Specifications must always read as follows: Quantity, Dia., Length Material Article Example: 1000 $\frac{1}{2}$ " x 3" Steel Cotter Pins				
Req. No.	Order No.	Date	Seller	Quantity	Size	Material	Price	Delivery

FIG. 11. PURCHASE ORDER RECORD

Such a purchase-order record as that illustrated is valuable for reference purposes. From it can be obtained: (a) A complete index of all orders under the name of the material; (b) a list of all vendors from whom the material has been purchased; (c) a record of prices paid, the fluctuations being easily followed by glancing down the last column; (d) a compilation of the total quantity of material purchased over any period; (e) a standardization of specifications and definitions. Whenever possible, a sketch should appear on the record, but with such things as sheet mica, sheet fiber, cotton waste, etc., the standard method of specifying should be printed across the top of the page, *e.g.*, "100 lb. clear North Carolina mica cut $1\frac{1}{2}$ in. x 4 in.—

Sample for testing purposes must be submitted before
order is placed."

termining the purchase. And since the purchasing agent has or comes in contact with or is offered almost every known article suitable for any kind of purpose, he is in an exceptionally favorable position to form an opinion and come to a decision in regard to many of them.

Enforcing Standard Definitions.—Figures 11 and 12 show what can be done in the purchasing department in the way of enforcing standard definitions. When any requisition is received in the purchasing department, the first thing to be done in connection with it

is to check it with the standard definition as given in the records; and if it is not in accordance with the definition, it must be corrected to conform to it. In later chapters the requisition will be dealt with more fully. At present it is desired only to show its connection with the standard definitions.

Whenever possible a sketch should accompany the definition. By the visualization of an article every time it is ordered it becomes second nature to specify correctly. With many articles sketches are unnecessary, and with others impossible; but the standard definitions should always be given. This applies to every purchase, including supplies, such as brooms, oils, waste, packing materials, stationery, carbon paper, ink, and so forth.

Many purchasing agents rely solely on their memories to correct improperly worded requisitions, long use having accustomed them to the needs of the establishment. Where a very limited number of articles are purchased it may be feasible to specify each item from memory correctly; but it is not good practice; it is unscientific, and it frequently leads to mistakes. Changes in materials and supplies are continually taking place, and the only safe and proper way is to make a permanent record of them.

It is not to be supposed that any purchasing agent is so well informed as to be able to describe correctly every article purchased. In some establishments the items needing definition would run into thousands; but even so the work of accumulating the definitions is not so stupendous as the large number would seem to indicate. The best plan is to consult the manufac-

turers and suppliers each time a new material or article is ordered, obtaining the correct standard commercial method of specifying it and making a permanent record of it. By adopting this course the whole range of purchases can be covered in a reasonable time. It will certainly repay any buyer to put a man on this work and, if necessary, let him devote his whole time to it until the records are complete.

Much valuable information can also be obtained from catalogs. This subject will be considered later in connection with the purchasing agent's library, but this source should be used to collect general information regarding any product, the number of sizes in which it is made, and the different styles, rather than to secure the definition of a particular item.

Intended Use of Articles.—Many articles have what might be called counterparts or prototypes. When in the market for any of these, the buyers are offered a legion of products which seem to differ but slightly the one from the other. Without any knowledge of the ultimate use for which such an article is intended it is impossible to be sure in what manner the substitutes offered are unsuitable.

Unfamiliarity with the manufacturing processes of the business for which he purchases is one of the prevailing weaknesses in the purchasing agent's profession. A buyer should know enough about the production and operating departments of his own factory to be able to make a reliable decision as to the utility of any substitute that may be offered. It is usually through the purchasing department that these alternative articles and materials come to light, and the

ability to discern what to reject and what to accept is a valuable attribute in a buyer.

Unless a buyer has a good working knowledge of the manufacturing methods of his own house and its product he is at a great disadvantage in dealing with salesmen. The buyer interviews many salesmen. Any one of them, for example, may handle only a single line or article and in that one field he may be an expert. He can designate exactly the advantages of his product in the manufacturing processes of the concern to which he is trying to sell, and if the buyer is not equally well posted on the products of his own house, he will not be able to handle the situation with judgment and discretion.

No matter what the nature of the purchase there are always questions arising which can only be answered by a knowledge of the intended use of the article, but it is not always possible for a buyer to have this close knowledge at first hand. In a very small business it may be, but in purchasing for a large corporation whose requirements embrace an enormous variety of objects, detailed information must be put into the purchasing agent's possession. And it must be put in such explicit shape that he can form his opinions and judgments on many questions from a paper standpoint.

The illustrations given earlier in this chapter of standard definitions and stock parts and their use in the product of a factory are extremely valuable adjuncts to a purchasing agent's knowledge. Not only do these definitions give him information regarding the product of his own factory, but they also give him

complete data, compiled by those who are in a position to know, and detailed specifications of all the articles and materials he purchases.

Samples.—Many purchasing agents maintain a sample file with contents tagged and indexed. This may be advisable where the purchasing is done from a central point with storerooms and factories scattered in various places, but there is not much to be said in its favor when the purchasing, storekeeping, and production work are all located in one group of buildings.

As a general rule buyers for industrial establishments do not show any great enthusiasm over buying from samples. Sometimes samples submitted by several bidders can be examined and put to some simple tests. This is of assistance in forming a decision on the relative values of the quotations and, furthermore,

- the sample can be retained and compared with the material finally delivered. This is the most reliable means of ascertaining whether the material finally delivered is exactly in accordance with the sample submitted. If repeat orders are expected the sample can be filed for reference when subsequent purchases are made.

Buying to sample should be confined to articles in which the chemical composition is unimportant or which do not have to pass any severe tests. But if chemical composition is important the only safe way is to specify the required composition in the body of the order and also to define any analytical and physical tests to which the material will be subjected.

In some instances an article may not be specified

or defined by the purchaser, but the onus is thrown entirely on the seller to furnish material that will perform certain work or fulfill some specified function. This is frequently productive of good results, because it starts a lot of sellers working for one buyer for one particular purpose, and out of the combination working for him the buyer may secure an exceptionally good bargain.

Quantity Purchased.—It is not usually the purchasing agent's business to designate how much shall be bought. Neither is it the storekeeper's, but this subject will be taken up under the discussion of stores handling, as it more properly belongs there.

If a special order is secured by the sales department of the factory the amount of material called for by that order is the determining factor. If the material is one which is carried in stock permanently, the requirements of the business and length of time consumed in getting delivery must be considered.

The first thing the purchasing agent wants to know is what the plant wants; and it is his business to secure what is needful to keep the production work moving along in its appointed way. The basis of scientific buying is to have an exact knowledge of these needs. They should be stated so precisely in specifications and requisitions that they cannot be misunderstood or evaded.

The skilful buyer should endeavor to move in the direction of standardizing his entire line of purchases. Of course, all articles are not subject to standardization; but in purchasing for a large corporation there is a big field for it. This is moving in the general

direction of a permanent buying basis, eliminating much work and argument from the seller's end of the game. The alert purchasing agent, however, cannot allow himself to settle back comfortably with the feeling that standardization has made his future path entirely smooth. The sciences that enter into manufacturing are moving forward at a rapid rate, changing materials and methods, and the purchasing agent must continually revise his specifications and definitions to keep abreast of manufacturing requirements.

CHAPTER III

THE SELLER

Relations Between Buyer and Seller.—Forming proper business connections with the seller is one of the most important phases of purchasing work. The economic aspects of the subject warrant consideration at this time.

In conducting electric current from generating station to the point of consumption certain transmission losses are bound to occur, and electrical engineers are constantly at work endeavoring to reduce these losses. In the world of business certain "transmission losses" caused by lax and unscientific methods of making connections between buyer and seller also occur. Strenuous efforts are being made to reduce these losses, and in these efforts the purchasing agent performs an important part. That the losses can be contracted and confined within well defined limits is beyond question; the benefits derived will be shared equally by buyer and seller.

The statement has been made that, in the last analysis, all the complex ramifications of business can be reduced to two functions—buying and selling. The contention being that other activities, such as accounting, financing, and advertising, exist as subdivisions of those two functions. Be this as it may,

commercial transactions do revolve around these two functions, and for economic reasons they should be brought into the closest possible relationship.

No one would be willing to admit that we have reached a condition where nothing more can be done to establish closer connections between buyer and seller. It is only necessary to review the vast amount of advertising and the strenuous endeavors made in all phases of salesmanship and compare them with the results obtained, to convince any skeptic on this point. A rectification of these conditions cannot be expected from the seller. He must go after business wherever prospects indicate a probability of obtaining it, and he must go after it in whatever manner seems likely to secure results.

The buyer should be as assiduous as the seller. But his methods are necessarily different, and he, if his purchasing is conducted along scientific lines, can be largely instrumental in reducing some of the losses.

When a purchaser buys any manufactured article he is getting in composite form all the materials which go to make up that article. The manufacturer of electric motors, pumps, typewriters, or loose-leaf ledgers had to buy various materials to produce these articles, and these materials, in turn, were the finished product of some antecedent manufacturing process.

This tracing back process can be continued until the original raw material is reached. The function of buying is exercised many times during this progress, and if in these movements its execution can be more economically administered and conducted it has a very appreciable effect on the ultimate cost.

The economic benefits secured by the efficient operation of a purchasing department are not confined to the department itself or to the establishment with which it is connected. There is a much broader and more general view to be taken, and one which affects the whole world of business in its influence on limiting some of the losses already alluded to.

Selling Expense and the Buyer.—A buyer should have exact information on all points relating to the material he purchases. He should know exact quantities required, when required, and the quality required. By accurate research he can then confine his inquiries, negotiations, and orders to those concerns who are in the best position to supply him. If evidence were taken from business houses it would almost unanimously show that a very large part of their correspondence, telephone service, and salesmen's time is employed in investigating incorrect definitions and specifications of material. Many times they do not handle the material that is asked for, or may be only in a second rate or second best position to supply it. And it very frequently happens that salesmen are sent out merely to clear up moot points, traveling long distances on needless errands.

These expenses must be included ultimately in the selling price of the material and articles affected and are therefore paid for by some buyer. There is no good reason why this condition should exist, because a purchasing agent can so gather and tabulate the necessary information that should eliminate a very large percentage of this wasted effort. It follows automatically that if improved buying methods effect

a saving in selling expenses, lower prices should eventuate with some resultant benefit to the purchaser.

Some proprietary articles and certain materials must be bought in which there is little or no competition, but outside of these there is a large field for the purchasing agent to create the competition he wants by the process of selection and elimination outlined. A purchasing agent must get the right kind of competition. Many think, because they have a large number of concerns who are prepared to quote for their requirements, that they have good competition. Nothing could be more fallacious. It is the purchasing agent himself who should dictate with whom he negotiates for prices and with whom he places orders. The consummation of every buying transaction should be effected with the least amount of expense, not only to the two principals concerned, but to all unsuccessful bidders.

It might be assumed that a purchasing agent is not interested in the selling expenses of the houses from whom he buys, but enough has been said to show that he has a very direct interest in the cost of selling. To further exemplify this let any purchasing agent review the cost methods of his own establishment.

A selling price is arrived at by a succession of steps or stages commencing with raw materials, followed by labor, overhead expense, selling expense, and to these, finally, is added a profit. If a purchasing agent studies this it will be brought forcibly to his observation what an important item selling costs are. With this in view he can make some calculations as to re-

ductions in the prices of the goods manufactured by his own establishment that could be effected if the selling costs were considerably lowered. And such a condition applies to every concern from whom a purchasing agent buys. If a permanent reduction can be effected in his own concern, a similar reduction can also be effected in others.

Reducing Selling Costs.—Only a few hints have been given as to the manner of reducing selling costs. Later on, these will be elaborated and some concrete instances given; but at present the following facts should be considered. All forms of entertainment advance the cost of doing business and raise sales costs. Undoubtedly this cannot be entirely eliminated; some expenses under this head are necessary, but the buyer can materially decrease them. It may be true that some salesmen indulge their own desires under the cloak of entertaining the buyer, but the buyer should not indulge in unnecessary entertainment for he is simply raising the price against himself.

If a salesman is kept waiting an inordinate length of time before interviewing a purchasing agent, it has a bearing on the number of buyers he can see during the day and therefore exerts an influence on the selling cost. Every journey a salesman makes to see a buyer, every call made while negotiations are pending, every time he submits new prints, every time he re-figures certain quotations, in fact every move he makes costs money and thereby increases the cost of selling.

The purchasing agent can do more than any one else to eliminate these waste movements and, further-

more, can encourage salesmen to work in this direction by furnishing accurate and specific information on all points when going into the market.

Segregating Sellers.—Except in a few isolated instances of manufactured products and in a few cases of exceptional commodities every manufacturer and dealer can be classified under one of two headings. He is either as well equipped to furnish a buyer's actual requirements as some other firm or he is not. It then behooves the purchaser to ask quotations only from those firms who are well qualified to furnish the required goods.

By way of illustration take the manufacturers of bolts and nuts. Some of them confine their output to certain types; others specialize on small sizes; again, some make only finished bolts and milled nuts. In ordinary practice the purchasing agent, in obtaining quotations, approaches these manufacturers in a hit-or-miss or haphazard manner. Probably he has a list of manufacturers or obtains the names from a classified directory, hoping by getting in touch with all to hit the one who can give him the best price and delivery. He may or may not succeed. Even if he does, his methods are unscientific, and he has increased the selling costs of many of them unnecessarily.

Illustrations analagous to the one given could be continued indefinitely. Dealers in lumber, manufacturers of chemicals, of stampings, of forgings, are all susceptible to a more rigid classification than is given in any business directory or index. The author has seen requests for quotations sent to many lists

of manufacturers and suppliers, and frequently not more than twenty or twenty-five per cent of the replies received could be used for competitive purposes. With a properly authenticated list, however, every inquiry sent out should bring a bona fide quotation.

Genuine Competition.—Every quotation received from sellers not in the best position to supply a purchaser's requirements is not only an economic loss but furthermore is not genuine competition. One might get a dozen such quotations and still not have obtained good competitive prices. Genuine and reliable competition can only be secured from a properly selected list of bidders. Prices obtained in a promiscuous manner cannot be used for comparative purposes with any assurance that the best results have been secured.

Sound competition can only exist between those parties who are best equipped to supply the particular grade or quality needed. This is the right kind of competition, and anything short of this entails economic losses in the operations of all those asked to quote for the business. To illustrate this again, consider a list of spring manufacturers. It will be found on close analysis that some of them make only heavy helical springs, others make springs of light wire, while others, still, are specialists in elliptical springs or springs of formed, stamped, flat-strip steel. Lumber dealers can also be subdivided into those who specialize in hardwoods, high-grade lumber for cabinet work, or rough lumber for mill construction or packing purposes.

These distinctions and refinements cannot be disre-

garded, and it is incumbent on the buyer to confine his activities in canvassing the market to those concerns whom he has previously investigated along the lines suggested. By this procedure only can dependable quotations and genuine competition be obtained.

In considering the economic situation in its relation to competition it must be borne in mind that if, by keen competition or clever maneuvering, a buyer closes a deal which entails a loss to the seller it is not a loss to the world of business. What is lost by one party is gained by the other; the general commercial economic system has suffered no loss, as it has in cases where unnecessary movements have been caused by unscientific buying methods.

Losses Through Incorrect Definitions.—In the preceding chapter stress was laid on the importance of correctly specifying and defining every article and all material. No matter how trivial or infinitesimal a purchase may seem it is necessary to describe it so carefully that no doubt whatever can possibly exist as to size, quality, and quantity. The reasons for this are the same as those already given for properly selecting the right sources of supply; for otherwise similar losses would occur. If negotiations were opened with only those concerns best equipped to supply the material, and then it was incorrectly or inadequately described, the situation would be just as bad as though the material were correctly defined and an uncertified list of vendors were approached.

It is quite as important to define an article of small intrinsic value correctly as it is the more valuable ones. Probably more so, because the proportionate

loss is greater. Instances have occurred where orders were sent out for very small articles whose value did not exceed fifty cents, but because of improper description a whole chain of inquiries was required to clear up ambiguous meanings, involving an expense far in excess of the value of the articles.

Departmental Losses.—So far, in the discussion of the economics of purchasing, we have confined our attention to the effects on business in general and to the effects through reaction on the buyer. But the economical operation of the purchasing department itself is also affected. Unfortunately, in too many purchasing departments the employees must spend considerable time in straightening out tangles arising from just the causes previously referred to. It seems to be looked upon as a part of the daily routine work which cannot be remedied. But this should not be the case, for this unpleasant feature can be greatly improved, if not entirely eliminated.

Proceeding along the lines laid down means the cutting out of all the unnecessary work of answering inquiries regarding incomplete, inadequate, or incorrect specifications; and when the business is placed with selected firms the work of following up the order and getting delivery is greatly facilitated, for they will have been chosen for their promptness in shipping and filling orders and their general service and attention. This means that shipping notices and bills of lading will be rendered promptly, enabling early advices to be given to the consignee department; and, what is perhaps most important, invoices will come in quickly and regularly. This latter feature

is one that is essential if all invoices are to be put through their regular routine in time for the cash discount to be available.

Where a very limited number of articles is purchased the purchasing department should work at an efficiency of one hundred per cent in getting competitive bids. This percentage cannot always be maintained where large numbers of articles are bought, nor where new kinds of material are continually being required, but something very near it can be secured.

The Market.—There is a logical market for anything and everything which it is necessary to purchase. It is incumbent on the purchaser, therefore, to confine his activities to those houses who can supply exactly what he wants. Experienced purchasing agents with proper records have no difficulty in this respect, but inexperienced ones can secure equal efficiency by following closely the instructions given later in this chapter.

The sources of supply may sometimes be very large, and the reverse may be the case with certain materials. But even when one has a large number of vendors to depend upon for a specific article it will always be found that some are not in the logical list.

As a measure of safety and preparedness for eventualities a buyer should develop emergency markets from which he can draw whenever the occasion demands. It is the purchasing agent who is responsible for maintaining a sufficiency of raw material for production work. Business acumen and foresight call for him to make provision for this in his scheme of buying.

Many causes may force the buyer out of the logical field in order to keep his factory running. Strikes, breakdowns, stoppage of transportation facilities, freight embargoes, and other causes contribute to this. Sometimes certain artificial conditions may exist by reason of which the logical source of supply does not offer the greatest attraction to the buyer. A depression in trade in another territory may make an opening for a good buy, or a combination working to the detriment of the consumer may be in effect among the regular sources of supply.

During an unprecedented demand for screw machine products because of war conditions, the writer had an experience which will serve as an example for the necessity for emergency markets. A small milled article had been bought in large quantities for a number of years, always within a radius of two hundred miles of the buyer's factory. Owing to the regular sources of supply having a surfeit of other orders, it was impossible to place with them further orders for this particular article except at an advance of nearly forty per cent and on six months' delivery. Some difficulty was experienced in locating another source, but finally a supply was found which, although it was some twelve hundred miles from the buyer's factory, furnished exceptionally good delivery and at a price only eighteen per cent over the old price.

Creating Markets.—Constructive buying is not a fancy phrase, it is a reality. Lack of sound competition, poor sources of supply, and sources located at inconvenient or distant points have brought forcibly to the attention of many buyers the advisability, if

not the necessity, of creating and developing new markets.

It has already been emphasized that potential competition is essential to good buying. When competition is weak or indifferent, it is time for the purchasing agent to get active and find a solution. Sometimes one or two big concerns may so overshadow the market as practically to eliminate genuine competition.

These and other reasons make it necessary for the purchasing agent to use vision and imagination, and by careful selection of likely sources to build them up by a process of nurturing and fostering until he has created a situation that has all the elements he needs for the efficient execution of his policies.

This development work, when applied to some of the smaller and weaker concerns, may call for strategy and tactics of a high order, for the buyer's diplomatic moves made to accomplish his purposes must not be disclosed either to a strong concern from whom he is buying, or to the weak one which he is trying to make strong in some particular line.

Important results have been achieved along these lines. One of the principal reasons for this is that the small man is having his selling done by the purchaser. His selling expenses, then, are negligible, and generally his overhead charges will be much lower than his big competitor. Quite often when the financial resources of the small concern are limited the buyer can arrange to purchase his raw material for him at lower prices than his cramped financial condition will permit. Such methods as these not only enable the pur-

chasing agent to buy at exceptionally low prices but give him the assurance of a reliable source of supply.

When a salesman discovers a "prospect" he assiduously follows it up, nurses it, and endeavors to convert it into a customer. It is equally essential for the buyer to discover "prospects," follow them up, cultivate their potentialities, and make of them important economic factors in his general scheme of business.

Other advantages crop out in developing the possibilities of smaller concerns. For example, it is profitable at times to bring to the understanding of the bigger concerns that they do not enjoy the monopoly they figured was theirs. In such cases, where the visible supply of an article may seem to be almost wholly in their hands, the psychological effect may stimulate them into actions which can only have beneficial results for the buyers.

Over-systemization.—Some large corporations have carried departmental formation to such extremes that subsidiary departments or divisions are formed in each original department, and even in these subsidiary divisions the work may be divided into several branches. Whether the multiplicity of segregations is responsible or whether it is because of lack of co-ordination or co-operation the writer does not know, but many experiences in buying from such corporations has amply proved that better service can be obtained elsewhere.

Generally it is fairly easy to get a quotation on new standard material from these over-systematized organizations, although there are exceptions. The

scheme of organization seems to have provided for this work to be done promptly. But if it is necessary to inquire about a shipment of some order, particularly if it should be a spare part for a machine, or to get a quotation on such an article, or information on anything but a big order, the inquiry is often times referred to several persons before a satisfactory answer is obtained.

The writer has no intention of "blacklisting" large corporations. He is simply recording that such conditions exist with many of them, and to a much larger extent than with smaller concerns. It is by no means unusual, for example, to be able to telephone to a moderate-sized firm and get information promptly and accurately; while all too frequently in dealing with a large company one is switched by the telephone operator to several persons, and then is finally asked to put the request in writing and send it as a formal inquiry. This inquiry, then, will probably pass through the hands of half a dozen persons before an answer is made, each handling averaging a delay of a day. Naturally, it does not take many such experiences to cause a purchasing agent to eliminate such corporations from his list of sources of supply.

Jobbers.—Every buyer prefers to place his order with the actual producer and not through the intermediary jobber. Not infrequently, however, it will be found that better service can be obtained from a jobber than from a manufacturer. This is a question of considerable magnitude and can be discussed from many angles. Price, of course, is the predominant argument and will be discussed more fully else-

where. The buyer should include some jobbers in his available sources of supply and should, by all means, retain their good will. Such jobbers as he may keep on his list will depend largely on what he is buying, for he will be compelled to purchase some articles through these sources. The manufacturer's selling policy of protection usually enforces this.

Again many manufacturers will sell direct to the consumer in picayune quantities. A manufacturer of machine screws, for instance, will take orders for one gross and ship direct to the user. But is the buyer gaining in service? The screws no doubt could be purchased from a local jobber and be delivered at the buyer's storeroom at a price little above the manufacturer's; while in sending the order direct to the manufacturer, located probably in a distant city, shipment may not be made at once and correspondence regarding it may arise; transportation charges also may have to be paid by the purchaser. The inconveniences connected with buying small quantities at some distance from the destination of the goods are all the purchaser's and not the seller's.

Manufacturers cannot carry stocks in every city. The jobbers do this for them, and hence they have a practical and legitimate place in the business world. Buyers are absolutely dependent on them for "pick up" orders, for example, and many times for "rush" orders.

Sources of Supply.—Another reason why the purchasing agent must keep a complete compendium of firms and localities where he can buy any material likely to be required by the plant, is that he may be

called into consultation at any moment on negotiations the sales department may have in hand for some big contract, and information will be required of him promptly and definitely as to where, when, and at what price the raw material can be secured. These particulars are essential, for the sales department needs them to determine on what basis to make its proposal to the customer.

Both the sales and production departments are apt to overlook the possibilities of securing certain classes of raw material promptly; and without duly considering this phase they will frequently make concessions to secure an order which ultimately may prove very costly. Steel and copper, for instance, may have to be purchased from warehouse instead of from mill to meet delivery dates; and the additional cost thus incurred should have been included in the sales estimate.

Selection of sources of supply is not done by intuition. It is a scientific process of accumulating data and recording them in orderly and proper shape so that the best source can be chosen at a moment's notice. Delivery conditions from the selected source must be known, and variations in the time required to obtain raw material must be noted. Advices covering this point should be sent as occasion demands to the manufacturing department to govern them in making their requisitions.

Records of Sources.—Indiscriminate shopping and marketing is inexcusable. All the reasons previously given and many others as well apply against a vague haphazard method of procedure in placing

MATERIAL _____		DESCRIPTION _____					Spec'n. No. _____				
SELLER	ADDRESS	CAT. NO.	FACTORY			SERVICE & REPUTATION					
			Location	Transp't'n. Facilities	Capacity	Shipping Promptly	Keeping Promises	Quality	Business Methods	Financial Standing	Special Features

FIG. 13. METHOD OF KEEPING RECORD OF SOURCES OF SUPPLY

Some of the information can be omitted if not essential or additions made as required. This form can be extended to include a complete catalogue index and a record of standard definitions.

orders without first investigating the recipient. All phases of the transaction must be foreseen during this investigation up to final termination of the contract by payment of the invoice.

A manner in which this information can be collected, accumulated, and tabulated is shown by Figure 13. The necessary data can be obtained through a great many avenues, some of which are enumerated in the following list:

1. Through experience in dealing with vendors and salesmen. Naturally one does not take all statements made by salesmen at their face value, but much useful information can be obtained.
2. By inquiries among firms in lines which are somewhat similar. This is probably the most dependable method and can be used with confidence. If, for instance, one has a good reliable source of supply for cold drawn steel, through this concern he could no doubt easily obtain information regarding manufacturers or dealers in tempered steel.
3. Through friendship with business men in all lines.
4. From catalogues. This source will be dealt with fully in a later chapter.
5. From observations made when visiting warehouses and factories. A buyer should always make a practice of making such visits at convenient intervals. Considerable knowledge of materials can be acquired at these times, and valuable information regarding manufacturing methods. Also the arrangement of stock should be

noted and calculations made as to whether it is adequate. Visits are often requested by sellers as a means of assuring the purchaser of their capability to take care of prospective business; or, a purchaser may insist on inspection of facilities before opening up business relations.

6. By scrutinizing the advertisements in technical journals, periodicals, or trade papers. Many good names can be culled from these and made the subject of closer investigation.
7. Reference to standard registers, such as Hendrick's or Thomas's, is constantly necessary, but it is often essential to sift the names there listed and further subdivide and classify them for one's particular purpose, as explained earlier in this chapter.
8. From classified directories such as the New York Telephone Company's "Red Book."
9. By membership in a local purchasing agents' association.
10. By membership in or inquiries made through the local Board of Trade or Chamber of Commerce.

Purpose of Records.—The information obtained through the above-named channels is desired for the following purposes:

1. To ascertain the position of the concern to insure satisfactory competition.
2. To discover whether any combination or collusion exists with other firms to maintain prices that would prevent genuine competitive bids.

3. To find out the location of the factory. One might buy from a jobber in Chicago, but actually the article might be manufactured in Connecticut. Such geographical considerations are often important.
4. To know the capacity of the factory. It is essential to know that the manufactory is able to take care of the business one gives them.
5. To obtain the reputation of the concern under investigation for making prompt shipments.
6. To learn the transportation facilities between point of shipment and destination. It is never wise to be dependent on one transportation line, or to take too big a risk of freight embargoes.
7. To make sure that the stock is adequate and well kept in the case of dealing with a warehouse, or, if with a factory, that there is an ample supply of raw material? It is a common experience to place orders with some factory and not to be able to get shipment because the factory cannot obtain its raw material.
8. To see that the vendor can supply the quality demanded.
9. To learn whether the vendor keeps his promises. If a firm's reputation is bad in this regard, the buyer will have endless trouble.
10. To ascertain the financial standing of the vendor. His position must be strong enough to insure that his business will move along its appointed way without let or hinderance. Buyers must have this protection.

Recapitulation.—Briefly recapitulated in tabloid form the advantage and benefits gained by the buyer by a close adherence to a properly selected list of sources of supply are:

1. Savings to business in general through reduction in selling costs;
2. Increased efficiency of purchasing department;
3. Protection against high prices;
4. Assurance of sound, genuine competition;
5. Confidence in getting a square deal;
6. Provision against irregular and delayed deliveries;
7. Relieving and facilitating follow-up work;
8. Prompt receipt of invoices;
9. Acceleration in the work of checking and approving invoices;
10. Guarantee of all cash discounts.

Unlike specifications and stipulations regarding quantities to be bought, which are not always within the jurisdiction of the purchasing agent, the question as to where to buy is entirely and absolutely under his command and control. His job is to find the market; and he can make large use of his supreme authority in this particular matter with benefit to his concern. His hands should be free, and his negotiations unrestricted by any questions of reciprocity, favoritism, or prejudice.

CHAPTER IV

THE PRICE

Price Versus Value.—Price in its common meaning and narrower sense is the amount of money fixed as the consideration of the transfer of property; but in a broader sense it means what one gives or receives in exchange for what is received or given. This view is one which can be studied to advantage by all buyers.

A vendor may sell a machine or certain material for a stipulated consideration represented in dollars and cents; but he may give such excellent service and even technical advice and assistance that, although the actual cash paid may be higher than similar property could have been purchased for from another, the value received may be greater. The reverse of this occurs when the buyer and seller mutually arrange a monetary consideration; the buyer pays it as the agreed price, but he may have to spend time and money following up delivery and getting possession of his property. In that case the real price paid is something more than the actual cash which is transferred.

John Ruskin said:

All works of quality must bear a price in proportion to the

skill, time, expense and risk attending their invention and manufacture. Those things called dear are, when justly estimated, the cheapest. They are attended with much less profit to the artist than those which everybody calls cheap. Beautiful forms and compositions are not made by chance, nor can they ever, in any material, be made at small expense. A composition for cheapness and not for excellence of workmanship is the most frequent and certain cause of the rapid decay and entire destruction of arts and manufactures.

Price, quality, and service must be considered together. Too often price is made the determining factor in the transaction. Right buying demands something more than a comparison and scrutiny of prices, for in industrial management price is sometimes a secondary consideration. although it should never be ignored.

Let us consider for the moment the other two factors. In Chapter II it was explained that practically all material used in a modern factory for production work must meet certain conditions as to quality. As far as the purchasing department is concerned no deviation can be made in the quality of the material so specified. Engineering tests and exhaustive experiments have predetermined the exact nature, style, grade, and, probably, size of the material, and it is the province of the purchasing agent to buy that material at the lowest price from the best available sources. Variations in quality or substitutions cannot be permitted without the consent of the authority in charge of production. If a purchasing agent were able to abrogate this feature the work of the technical staff and the expense incurred in making the tests and experiments would be completely nullified.

Somewhat different conditions surround the buying of supplies, and usually the buyer has more freedom and some voice in selecting quality. This is because the supplies used in a manufacturing establishment are not a component part of the finished product. The reputation of a concern depends largely on the uniform and sustained quality of the goods turned out, and the raw material purchased for these goods must not vary. But with supplies the purchasing department can frequently be of great service in bringing into use certain supplies, small tools, and similar articles which might never come under the notice of the shop.

In making purchases, therefore, of raw material whose quality has been predetermined and is not under his control the buyer is confined largely to specializing on price and service. Regarding the latter, general information should already be on record, as explained in the preceding chapter; but special conditions in connection with a purchase may need special investigation, and the purchasing agent must know he can get delivery at the times required by the production department. These considerations must be borne in mind in forming any opinion on prices quoted. With several bidders on equal terms as regards service and delivery, price only remains as the deciding factor and the buyer must then concentrate on this.

When quality is left in the purchasing agent's hands for determination, his responsibility is much greater. The exact measure of utility is the value of an article. Highest quality does not necessarily

mean greatest value to the user. An article or some material which is graded higher than the actual conditions demand, might not be as serviceable for the purpose as one of a lower grade.

Empowered to decide questions of quality the purchasing agent must weigh the merits of hosts of substitutes which are constantly being brought to his attention. The tendency with many buyers is to refuse to consider substitutions which would involve paying a higher price, but this is a narrow view to take. To deal intelligently with the question of quality, comparing the intrinsic values of substitutes offered, and finally deciding which is the best price, presupposes that the purchasing agent has an intimate knowledge of the uses of the material in his own plant and a wide knowledge of the many variations of materials he is buying. Purchasing for an establishment with a limited product may be done on these lines, but beyond a certain point it is an impossibility, and the buyer has mainly to devote his activities to price, service, and delivery.

Discussion of price and quality can really lead only to one result. They are fundamentals that must be given equal consideration in every legitimate purchasing transaction if well balanced results are desired. If in any important transaction a buyer first ascertains the minimum of quality that will be acceptable to the user and the maximum of price that will be tolerated, he can find, if lines of price and quality were charted, the point at which the two intersect.

Summarizing the discussion of price, quality, and

service, it resolves itself into this: If two or more sellers quote on identical articles, all naming the same delivery and the same terms, and all being equally reputable, the low price should get the business. If prices, reputations, and terms were all the same, but one could meet delivery requirements better than the others, he would get the business. All other things being equal, the one having a better reputation than the others would naturally be the recipient of the order.

A real danger exists if price is made the prime consideration. If this should be insisted upon by all buyers, the result would be that manufacturers would have to cheapen their product to meet the stipulation. The cumulative effect of this would be retrogression and decay.

Whatever buyers may do, however, manufacturers are fortunately not inclined to follow this direction. Without exception one may find manufacturers maintaining a fixed standard of quality or making strenuous efforts to improve their product.

Price Knowledge.—The method of asking for quotations for purposes of comparison is universally adopted by purchasing agents. It is sound in theory and uniformly successful in securing prices for a particular material or article. It is assumed, of course, that only concerns are approached which are in the best position to supply such material.

But when these prices are obtained the buyer's price knowledge has not been broadened. They do not tell him why prices are high or why they are low. They do not increase his knowledge of the re-

MATERIAL _____							
Date	Price obtained from	Quantity	Price	Terms	Freight	Net	Can ship in

FIG. 14. FORM FOR RECORDING PRICES

The third column should indicate whether the price was taken from an invoice or was a quotation, verbal or otherwise.

lation between price and demand; the relation between trade cycles and prices; how advancing prices may be anticipated, and how declines in prices may be forestalled. All these things constitute price knowledge.

Price knowledge starts by becoming well versed both in prices of daily purchases and of general current prices. Such knowledge is a valuable acquisition to any person engaged in buying or selling, because it gives one a mental picture of relative values which cannot be obtained in any other way. Continued application and practice in reviewing prices will yield a vast fund of information. An ability to know values can be more easily developed than might seem possible. Almost countless numbers of articles are bought by some purchasing departments, and, of course, it is not to be supposed that their prices can all be retained mentally; but the department is a storehouse of information, and should keep records, not only of actual purchases, but of all material in which the establishment may be interested.

Daily Quotations.—For prices of other articles of interest, but which may not pass through a purchasing department, the quotations in the daily and trade papers may be utilized, as nearly all raw materials and many standard finished and semi-finished articles are listed. This source of information is a fruitful one, and a perusal or even cursory examination of these quotations will add greatly to price knowledge.

A knowledge of daily quotations and prices of daily purchases gives a sure indication of the general trend of prices. Everybody wants to know, or

to be able to divine or anticipate, changes in prices. A tendency towards an advance or decline can be predicted with some assurance by a close student of current prices. This is not solely because of a knowledge of a price or prices, but because any change in a price excites curiosity as to the cause of the change; seeking for the cause opens up a whole field of information on which an opinion can be based as to future price movement.

In a large company, or in a concern where the purchasing agent needs no authorization before making stock purchases, such information is exceedingly valuable, for material may then be obtained at favorable periods. Even in those cases where the purchasing agent has no authority to buy except as instructed, he can, nevertheless, make suggestions to the proper authorities with a view to taking advantage of an existing favorable market. The buyer who can forecast an era of high or low prices is a factor of great economic importance in any establishment.

Price and Demand.—As already stated, fluctuations in prices force one to look for the cause. They are usually found to be the results of fluctuations in demand. In other words, the shrewd buyer must look beyond mere price, which is not more than a beginning of knowledge of the market. Knowledge of demand gives an idea as to probable rise and fall. It is the most powerful element affecting prices. Knowledge of demand, therefore, is essential, and can be acquired and assimilated in much the same manner as knowledge of current prices.

With knowledge of demand must be coupled knowledge of supply. Demand for a commodity might be exceptionally large, but if the supply keeps pace with the demand at a proportionate rate, little or no effect will occur in prices unless from other possible contributory causes. Purchasing agents are apt to overlook or ignore the important factors of supply and demand so far as their effect on general purchases are concerned. But every buyer is interested to some degree in some product. Traders in such commodities as wheat, cotton, copper, or coffee are keenly alive to the necessity of being thoroughly posted on the supply and demand of the commodities they deal in. Voluminous statistics are kept by them. Agents report to them regularly, and special avenues are kept open through which this information can be obtained. Without such information no firm could hope to compete successfully with those equipped with it.

Contributory causes of price changes are so many and so varied that only a few can be mentioned. The general state of business is, of course, one of the determining factors.

Sectional depression is another cause, but one not so prevalent in this country as it once was. This is because industries are becoming more widely scattered. The prosperity of the Southern States, for instance, is not now entirely tied up with cotton. If any particular industry is more prosperous than another, other industries must benefit from this prosperity, and this tends to keep industry in general on a common level. Better communications, transpor-

tation, and the spreading and diversification of manufacturing throughout the country all exert an equalizing effect on business conditions between the various sections.

Another factor affecting business, and therefore prices, is politics. This is not only because the tariff question is kept alive, but also because of the attitude of politicians towards capital and labor. If the tariff question were settled on a scientific basis and both capital and labor were satisfied that a square deal would always be accorded them, business would become more stable.

Strikes, lockouts, freight embargoes, and other disturbances also upset markets, and, in the case of perishable goods, create at least a temporary demoralization in the prices of the goods affected.

Trade Cycles and Prices.—What is a normal condition of business? Either prosperity or depression might endure so long that the resulting condition could rightly be regarded as normal. But business is nearly always moving in cycles, and at each period of the cycle a different buying policy should prevail. While the high and low points of a cycle may not reach such acute stages as to be designated “prosperity” and “depression,” these terms will be used here for illustration.

First Period: Liquidation. This period is indicated by declining prices, and the buyer’s policy during such a period is to purchase only what is absolutely necessary—to accumulate no stocks of raw material, and to keep the minimum amount on

hand that will assure the production department a supply equal only to its immediate needs.

Second Period: Depression. During this period more confidence can be displayed in buying as low prices prevail; but it is not wise to purchase too heavily until there are signs that the liquidation period has exhausted itself.

Third Period: Improvement. This period is an era of advancing prices, and buying can proceed confidently for requirements as far ahead as one's finances will permit.

Fourth Period: Prosperity. It is taking considerable risk to buy heavily during such a period as this. Prices are high and irregular, and great care should be exercised in making purchases. Some commodities will reach the peak prices earlier than others; while many may fluctuate in a most tantalizing manner, touching the high point several times during the period.

Exports and Prices.—The exports of this country are normally greater than its imports. When this condition reaches abnormal proportions, as during the shipment of supplies to the European nations during the war, it has a distinct influence on prices. We are sending away our wealth in the shape of steel, copper, and other metals in raw, semi-manufactured, and finished manufactured products, and also a great many commodities. The available supply decreases and prices advance, but the situation is aggravated by the fact that we receive in exchange large amounts of cash. Thus our wealth in

actual cash is increased abnormally, and the money so obtained may be used improperly for speculative purposes, creating unhealthy booms. Even if it is used for investment in real estate or in the purchase of automobiles, it has the effect of advancing the real estate values and the prices of automobiles.

If we had need of or could accept other material as imports to offset our exports, prices of many things would remain more stationary. This is the condition in Great Britain and in other countries where the imports have always been largely in excess of exports. Of course, large amounts of cash due us from other countries in payment for the exports have never reached us, but instead have been used to liquidate the debts we owe to those countries. We have been losing material possessions, but we are becoming independent financially. This may be going a little beyond the subject under discussion, but is intended to show what effect abnormal exports have on prices and in what manner a surplus of money will influence them.

Price Authority.—The purchasing department should be supreme throughout any organization on all questions of prices of materials and supplies, whether used in the production department or not. Sellers should not be allowed to quote to heads of departments; to do so weakens the authority of the purchasing agent. When he is known to be the court of last resort, he becomes an element of power to be reckoned with.

Many establishments maintain an extensive estimating department, and quite often this department

needs prices of certain materials for the contracts on which it is estimating. Those prices should always be obtained through the purchasing department. There are several reasons for this: the department should know the best source of supply; the price knowledge of the department is increased, and finally its records are enriched by tabulating the information obtained.

Negotiations leading to the establishment of a price with the seller should be entirely in the hands of the purchasing agent, and he should be sole arbiter in all the final arrangements.

In making a decision as to best price or with whom an order should be placed several factors, such as cash discounts, terms, f. o. b. points, etc., must be considered. These, however, open up such a wide range of possibilities that their discussion will be left to another chapter. Assuming that each bidder stands equally on these contingent possibilities, the present discussion will be confined to the manner of getting the lowest price.

Manipulated Prices.—Taking the most disagreeable feature first, the question of manipulated or artificial prices will be considered. Anything of this nature is a source of annoyance and irritation to the buyer because, in most cases, he can do so little to evade paying the inflated price. Many buyers, not knowing when a price is artificial or is not warranted by conditions, pay it in happy ignorance; but the astute buyer knows, because his observations and records of available quantities and market conditions have kept him informed.

In the case of a patented process or article the manufacturer is entitled to a fair and legitimate profit, not only on his manufacturing costs, but also on his work in developing and perfecting the process or article. No buyer can object to paying a price arranged on such a basis; but when, by manipulation or combination, a price unwarranted by known and existing conditions is quoted, the buyer has every justification in attempting to get around it.

Unfortunately, as a rule, there is very little the buyer can do. It is in such instances, however, that his knowledge of substitutes, as previously mentioned, or his ability to develop a new market, may stand him in good stead.

Competitive Prices.—Unrestricted, open competition is a pleasant field for the purchasing agent to browse around in, for here his activities can have full play. This method of securing bids from two or more sellers must be employed irrespective of how profound a knowledge of prices one may have.

The firms asked to quote must be competent to handle the business. Any concern whose bid will not be considered in the last analysis should not be asked to quote. It is a waste of both the buyer's and the seller's time. The wording of the invitation to bid should be lucid, and should state distinctly the quantity, grade or quality, and be accompanied by complete detailed specification if necessary. It should be stated whether a lump sum price or unit price is desired. The unit price method is generally favored, because if there should be any change in quantities between the time the inquiry is sent out

and the order placed change can be automatically taken care of. Unit bids are also useful for recording the separate prices, as well as for future reference.

Having these competitive prices tabulated for examination several salient points may possibly thrust themselves on the attention of the shrewd buyer. Should all quotations be uniformly equal it will indicate either that manufacturing methods are so standardized and perfected that all bidders are figuring on a similar basis of costs, or that some trade agreement or combination exists for maintaining prices at a fixed level. Should one quotation be notably lower than all the others, a master of prices would rightly regard it with some suspicion, and his sound knowledge of prices would suggest to him that the goods could not be produced at the figure named unless the quality were inferior. But just because a quotation is low is not an adequate reason for discarding it entirely, for assuming that a reputable concern, as should be the case, has made the quotation it is worthy of consideration. On investigation it may be found that there are good and sufficient reasons for the low price. It may have been induced by a desire on the part of the seller to keep a section of his factory in operation, or to reduce a surplus stock of material.

When bids on identical specifications show wide variations, the purchaser should immediately find out whether any double meaning could be read into the specification, and it is advisable to interview both the highest and lowest bidders and go over their proposals. This will bring to light any misconcep-

tions which may exist. Variations in quoted prices quite often occur in the purchase of tools and machinery, because it is the practice of some makers to quote for the bare machine, while others will include some additional parts and attachments. For this reason all quotations for machinery equipment and appliances should be carefully scrutinized.

These instances come up in the course of every active purchasing agent's work. By way of illustration: an inquiry sent out for some voltmeters and ammeters mounted on slate panels elicited a reply quoting for the instruments "as shown in our catalogue pages 53 and 56." This quotation was for the instruments required and was in every way acceptable—except, on reference to the catalogue, it was found that only the bare meters were illustrated; hence, the quotation did not include any panels, or even the lugs for them! For his own protection a buyer should carefully check up any references to catalogues or prints. In the case cited it may not have been intentional on the bidder's part to call attention to the fact that he had not included the panels, but if the order had been placed the responsibility would clearly have rested upon the buyer.

Strategy in Arranging Prices.—Much misinformation exists as to the manner in which a purchasing agent's activities are conducted. The opinion is far too prevalent that he exists mainly to beat down the seller's price. This may have been true at one time, but to-day sellers will not tolerate much of this, even if buyers were generally disposed to use such tactics.

Probably no two purchasing agents go about their

job of buying on exactly similar lines, but all buyers have a common object—to obtain the lowest price for the goods they are ordering. The desire to close a deal at the right price and secure every concession possible from the seller is a phase of the commercial instinct which must be present in every good buyer.

Tactics and strategy play their part in the negotiations leading up to the actual placing of an order, but not to the extent they formerly did when business was done on more direct lines. The present ramifications of business call for entirely different methods than those which prevailed when the producer and consumer were nearer to each other, when jobbers, salesmen, and other intermediaries were not so numerous, and when manufacturing was not so highly specialized as it is now.

It was not so long ago that the generally accepted theory of the qualifications necessary for a good buyer was an ability to bluff the seller and to adopt some such tactics as have been so well illustrated in "David Harum." While developments have been taking place in the function of buying, the old-fashioned persuasive type of drummer has been giving place to the modern scientific salesman.

Despite the fact that the modern buyer is surrounded by an accumulation of facts concerning his purchases, his sources of supply, records and prices, and other information on which to base his judgment, there are situations which arise in the experience of every buyer when tactical and strategic moves are necessary to put through a deal on satisfactory lines.

If a buyer relied solely on the information he has

scientifically accumulated, it might tell him to do one thing, whereas his instinct for a good purchase might suggest doing something different. The records which are gathered by purchasing agents have had a tendency to eliminate the purely trader's instinct from the buyer's psychology, but that this instinct is still necessary cannot be gainsaid.

Buying Methods.—Buying methods have changed considerably in recent years, and the tendency among manufacturers and suppliers is to quote the lowest price they can consistently make. They do not expect or wish to quote a second and lower price. One reason for this is that they now have more accurate cost accounting systems and, hence, can more correctly determine their costs, and therefore their selling prices. When a manufacturer is uncertain of his costs he is usually uncertain as to the price he quotes, and is frequently susceptible to an offer of an order at a lower price. A large and shrewd buyer once made the statement to the writer that the first price quoted by a manufacturer was never his lowest price. To a certain extent this may have been true at one time, and resulted in innumerable schemes and considerable maneuvering on the buyer's part to get a reduction in the price.

With the standards now maintained by most concerns the practice of offering an order at a lower price cannot be defended. If such were the general custom of a buyer the prices quoted to him would always be on a basis which could be scaled. Many manufacturers will not consider or sanction methods of this character.

Nevertheless, there are instances where an order might be "offered" to a manufacturer. This has been done many times recently in those cases where the concern quoting the lowest price was so loaded up with work or so located on a transportation line that prompt delivery was extremely problematical. In such an instance the buyer is justified in endeavoring to get another manufacturer more favorably located to meet the competitive price.

Examples of Buying Methods.—A case in which a purchasing agent did some thinking outside of his routine work occurred in connection with an order for malleable iron castings. These had always been bought in quantities of ten thousand at a time and had been purchased from one foundry. The original pattern had been made by the foundry, and the sample casting submitted by them had been approved. A new man was put in charge of the purchasing, and the first time he was called upon to buy these particular castings he sent blueprints to several foundries with requests for quotations. The concern that had always supplied the castings was the lowest bidder, and there seemed no reason why it should not receive the order.

The price quoted had been per pound, but the purchasing agent asked for second bids, the unit price to be per casting. As a result two quotations were received lower than the one from the foundry that had always supplied the castings. On investigation it was found that the original pattern had been made too full all over, making the castings twenty per cent heavier than necessary. Consequently a saving of

nine hundred dollars was effected in the quantity ordered. Had the purchasing agent been content to accept the quotation per pound instead of checking it with a unit price for each casting his company might have gone on indefinitely paying for twenty per cent more metal than they needed.

In negotiating for a six months' supply of machine bolts, a purchasing agent had a problem to solve which comes to every buyer at some time. He had determined from his records and information that a certain manufacturer was best fitted, equipped, and located to handle the contract, but his price was higher than several others. On careful consideration the purchasing agent felt that he was not justified in paying the higher price, but at the same time did not abandon the idea of getting him to accept the contract.

He kept the negotiations open until the time was approaching when deliveries would have to commence, and he felt he could not safely postpone doing something. In delaying the closing of the contract he had the salesmen of the bolt manufacturers anxious and uneasy, and finally the one representing the lowest bidder signed a contract for an order of a small quantity and gave the purchaser an option on the whole quantity. Having this as a safeguard, the purchasing agent was able to adopt an attitude of complete indifference to the other manufacturers. Hence, when the specified date arrived on which deliveries should begin, the manufacturer with whom the purchasing agent desired to make the contract offered to sign up at the price of the lowest bidder.

The first contract was something to fall back on, and was made as an insurance against being left if the other manufacturer did not come to the terms and price the purchasing agent felt justified in paying. The small quantity specified in this contract was taken, and the purchasing agent was also able to give more business for other material to the same concern; but the main contract for bolts went to the manufacturer who had been selected in the first place by the purchasing agent as the one to whom the preference should be given if the prices were equal.

Diplomacy cannot be systematized, tabulated, nor card indexed, but it can be developed, and every purchasing agent will find ample use for it. The simple cases related are actual experiences, but there are occasions when the moves made in negotiating a purchase are very much more intricate and involved. The intent has been to point out the value of using a little diplomacy in conjunction with the scientific knowledge which every purchasing agent should possess. A too rigid adherence to fixed methods would be a deterrent in many cases, while the adoption of somewhat different tactics would consummate many a deal on satisfactory lines.

Resale Prices.—Certain manufacturers elect to sell their product through jobbers, dealers, merchants, or whatever trade name these middlemen do business under. It is the custom for the manufacturer to sell to the dealer at a lower figure than to a consumer. This is the dealer's protection. Sometimes a manufacturer will rigidly adhere to this policy, while others will sell to whomsoever they can. Abuses of

these ramifications of business arise in every direction, and it is not proposed to discuss them here; but a purchasing agent should know when they exist, and he can only gain this by experience.

Some purchasing agents are legitimately entitled to a "resale" price. A builder of machine tools, for instance, who does not build the motors for operating them can always obtain a "resale" price on motors if they are to be sold again with the machine. This condition applies to many articles which are finished machines or appliances in themselves, but are purchased to form part of another equipment.

Many buyers for large corporations obtain the regular discount allowed to dealers simply by reason of the large consumption by their establishment. Again, some manufacturers have a sliding scale of discounts; to the largest buyers the largest discount is quoted, and this discount diminishes in a ratio proportionate to the amount of the purchase. Such a policy has been bitterly assailed by some on the grounds that it places a handicap on the small user and favors "big business" interests. There is some truth in this contention, because the big buyer often may not take any larger quantities at one time than the small one.

Price Based on Performance.—This method of establishing prices has been slowly developing and is steadily growing in favor, but at present is confined to a very limited number of articles. No reason exists why it should not be extended in connection with more scientific manufacturing and the standardization of products and commodities. Technical

knowledge of materials, new ideas and inventions in manipulating these materials in the manufacturing process, and, finally, skill and long practice in the application of the finished article to its ultimate use, are bringing about a condition where the producers and sellers are able to guarantee certain definite results.

Railroads have long bought lubricants for rolling stock on this basis. Coal is quite commonly paid for on the number of heat units generated. Brake shoes and automobile tires are other well known examples of price based on economy of operation. With more definite information regarding performance under operating and manufacturing conditions there is no reason why this form of buying should not spread.

Price Guaranties.—Many sellers are quite willing to enter into agreements to guarantee certain prices for a fixed period of time. Not only will they undertake to furnish all the buyer's requirements of the material stipulated during the stated period, but they will go further and guarantee the purchaser against any declines in the market price during the life of the agreement. Many buyers have fought shy of purchasing on this bases, either because the conditions did not appeal to them as equitable or because of a fear that by tying themselves up to one source of supply they would, at the expiration of the agreement, have a limited competition for future requirements and would be liable to a "hold up" on the part of the original seller if the price in the meantime had gone against him and had involved him in a loss.

The first reason has no foundation in fact. If it is

inequitable in that it obliges one party to assume a risk not shared by the other it cannot long be maintained. Prices can be guaranteed without undue risk, because the guarantor has a like guarantee for his raw material and can calculate his labor and overhead expense very closely for the period of the contract, with the strong probability that they will remain stationary or nearly so. Any risk of advance in these is offset by the possibility that he may be able to reduce them.

More tangible reasons to support the contention that the buyers' market would be restricted by entering into such price agreements might occur, but these apply only in those instances where the sources of supply are limited. If there are only a few sources and each one of these ties itself up with certain buyers, the sellers can virtually control the situation when the time comes to make renewals. The buyer can overcome this obstacle, however, by covering his requirements by price guarantees with two or more sellers. This will be more fully considered in the discussion of orders and contracts.

Price Maintenance.—The following quotation, from an editorial in the New York Times, is of considerable interest because it discloses the fact that Congress is taking notice of the practice of selling at a lower price articles absolutely identical with patented ones and made by the same manufacturers.

The matter of price maintenance, which has engaged the attention of Congress at odd times for several years, promises to come in for further notice. Among the first of the bills introduced on the day when Congress met was the one by

Representative Stephens of Nebraska, which failed to pass in the session that closed on March 4. As a pendant to it was another bill, with an additional section, which is peculiar. This new feature makes price maintenance not apply where the label or container does not show the source of production, and concerning which no representation is made that it is the "product of, or associated with, the name and reputation, of any grower, producer, manufacturer, or owner of a trademark or special brand." Such a provision would seem to intimate that a number of producers and manufacturers have made it a practice to turn out goods without their distinguishing labels, which have been sold at lower prices than goods that were branded. A number of such instances have been referred to in the discussions of the subject of price maintenance, many of them referring to foods. The practice, however, is not unknown in the textiles. Those who sold such goods gave their customers to understand that the lack of trademarks or labels enabled them to get identical articles at lower prices. They would not be able to make such representations should the proposed legislation be enacted. It is a little difficult to make out whom this would hurt most.

Other Arrangements.—Prices are sometimes arranged, as previously mentioned, on a sliding scale basis, the scale conforming to the quantity bought by the consumer. Again, prices may be arranged at a certain percentage plus or minus the market. There are also prices fixed by implication. These occur in "pick up," "rush," and emergency orders, no price being actually mentioned, the supposition being that the prevailing market prices will apply.

After all is said about prices the fixing of the price at which an order is closed is a mutual affair. Sellers do not like to think that they are dictated to by the buyer, and salesmen of repute would scorn such an imputation. On the other hand, purchasing agents are apt to feel that prices are largely controlled by

supply and demand, added to which is the influence of his personal acumen and perspicacity.

It should be borne in mind that abnormally high prices are always subject to decline, and quite frequently the decline is at a more rapid pace than an advance would be. When prices are rising there are always some orders placed in anticipation of still higher prices, while in the decline the tendency is to hold back for lower prices. This accelerates both the rise and fall.

Speculation and gambling, as the terms are generally understood, should have no place in the purchasing agent's psychology, but it requires no genius to buy at the ruling or normal prices. To keep a close watch on the trend of prices and movements of commodities, to study all factors that may influence an advance or decline in values, to buy sparingly when prices are on the down grade and liberally when on the up grade, and finally to evade the evil of overbuying at the break of the market, is not speculation or gambling—it is purchasing reduced to a science.

CHAPTER V

THE CONTRACT

Care in Making the Agreement.—Every buyer should have due appreciation of the importance of orderly procedure in arranging all the details of his orders and contracts. Intelligent care must be exercised, and there must be rigid adherence to a few simple essential rules and methods, both prior to the placing of an order—while the negotiations are in progress regarding prices, terms, and other details—and when the order is being actually closed, either verbally or in writing. For his own protection, and to prevent disputes, the primary interest and concern of the buyer should be the strict observance of the elementary rules with respect to the constitution of the contract, in order that all the stipulations contained in it may be clear, exact, and comprehensive.

Before any purchase can be consummated the two parties concerned—i.e., the buyer and the seller—must reach an agreement. This agreement, whatever the manner in which it is reached, is the all-important basis of the contract. In fact, the agreement is the contract, and all the future relations between the two parties, in so far as the particular transaction is concerned, are governed by this agreement.

The agreement to buy and sell must consist of an

offer by one party and its acceptance by the other. This implies that there must be a complete mutual understanding of the exact and definite nature of the material or article being bought and sold, the price, terms of payment, and other conditions. In the general practice of purchasing, innumerable questions are continually arising after an order is placed, regarding the stipulations and conditions of the agreement. These questions lead to an examination of the factors on which the agreement was based, and in cases of dispute it will always be found that the misunderstanding has been caused by insufficient attention being given to some essential details.

Verbal Orders.—If an agreement is reached between buyer and seller solely through conversations, it is a verbal contract; a very large number of contracts are closed in this way. The conditions governing purchasing for industrial establishments demand that these verbal agreements be reduced to writing, and it is important that formal orders embodying the features of the agreement be written up and delivered to the seller.

Written Contracts.—These are necessary not only for the smooth and efficient working of the physical and mechanical features of a purchasing agent's office, but because of the practical desirability and even necessity of written communications. If an agreement has been reached verbally there should be no delay in putting it into writing, and certainly this should be done before the seller has taken any steps to manufacture or deliver the goods. If there has been any misunderstanding, it is then brought to the

attention when the contract is put in writing, and mistakes can be rectified and adjusted in the earliest stages, while all the details are fresh in the memory.

Preliminary Communications.—I have already emphasized the fact that the negotiations, communications, and dealings leading up to the consummation of the transaction are of primary importance. It is of the utmost importance, also, that these be carried on in the clearest possible way. Memoranda should be made of all prices and figures quoted in interviews or by telephone. The buyer should ask the seller to confirm immediately in writing any understanding arrived at in this way, or he should himself forward at once to the seller a formal order embodying the agreed terms and conditions, at the same time making reference to the verbal arrangement on which the order is based.

For the clearer understanding of the preliminary and final negotiations, and for the purpose of having these follow a well-defined and regular course, it is absolutely necessary to have standardized forms for all communications that pass between buyer and seller. These include well-recognized forms for requesting quotations and the acceptance of offers either by letter or by telegram, and forms of orders issued with or without a preliminary agreement concerning the exact terms.

Distinction Between Offer to Sell and Tentative Bid.—It is important from the viewpoint of both parties, that a distinction be made between an offer to sell and a tentative bid. A buyer might so frame a letter that it would convey the meaning that he is

making an offer to buy, whereas he may only wish a quotation, or an offer to sell, from the vendor. Any communications from sellers, naming prices, should be closely scrutinized, for it is important to determine whether there is really a definite offer to sell or only a tentative quotation. If a buyer wishes to take advantage of an offer to sell, he should promptly communicate his acceptance in writing. Sometimes a quotation will be made subject to acceptance within a specified time; such a limitation implies an agreement to sell before the date named. It is often advisable for the purchaser to ask for bids containing a stipulation of this character, to enable him to consult with others before closing the deal.

A fact to be remembered is that if an offer is made by either party, and in communicating an acceptance the other party makes modifications of any kind, the negotiations do not constitute an acceptance, but are in themselves a new offer and are in like manner subject to acceptance or rejection. Since an offer and an acceptance are the essential elements of a contract, the purchaser should see that the negotiations are conducted with some definite understanding. The purchaser should clearly distinguish, in his dealings with the seller, between definite proposals the acceptance of which would constitute a contract, and others which are only tentative in their nature.

Changes in Contracts.—As it is assumed that when formally written up and executed the order, or contract, embodies and conveys the true meaning and intent of the offer and acceptance, it follows that the order is irrevocable except by mutual consent.

Should any modifications be desired by either party they can be effected by the cancellation of the contract and the forming of a new one on the basis of the new understanding, or in most cases it is sufficient to follow the procedure by which the contract was originally made. That is, one party can make an offer to modify it, and can secure an acceptance from the other party.

What the Contract Should Include.—It is extremely important that both parties clearly understand the nature of a contract, or order. I therefore give below the items that a contract should include:

1. The date of the contract.
2. The names of both buyer and seller.
3. The quantity of goods being contracted for. It is comparatively simple to state in figures or words, or in both, the exact amount being purchased.
4. A proper definition of the quality, nature, character, style, grade, or other description that will absolutely and positively identify the article in clear, unmistakable language. The importance of doing this has been emphasized in Chapter II, and will be further discussed in the succeeding pages.
5. The time when delivery is required.
6. The place at which, it is agreed, delivery shall be made.
7. The price to be paid by the buyer. There are two methods in general use for naming a price. It

is done by stating either the price per unit or a lump sum price. Both methods are comparatively simple—they have been fully covered in Chapter IV.

8. The date of payment.
9. The method of payment, and any special terms, cash discounts, and other features agreed upon.

Definition of Quality, or Grade.—Further discussion of some of the clauses mentioned is essential to a proper understanding of their importance. It is an implied condition of an order issued in the general way that the buyer may reject the goods if they are not of the kind and description specified in the order. But he has no remedy against the seller—he can only reject the material tendered.

If the production work of a factory is absolutely dependent for its success on the obtaining of a particular grade, size, or weight of material, then it is essential that the contract contain a positive promise and undertaking by the seller to deliver such particular grade, size, or weight. With this undertaking accepted by the seller, the buyer can hold him for damages for any loss the latter may have been put to on account of the seller's not delivering the right goods. It may be necessary in some cases to secure a warranty from the seller, which would entitle the buyer to a definite remedy in the event of a failure on the seller's part to deliver exactly the right kind of goods. The determination of quality in such cases should be decided by such analytical or physical tests as may be agreed on and stipulated in the contract.

Time of Delivery.—The time for delivery is a very serious matter in the case of some purchases, and it should be clearly set forth whether delivery is required in instalments, and at what times, or whether a total delivery is required and the date of that delivery. Prompt delivery on a certain date may be a matter of great moment to the purchaser—if he does not receive the material, he may suffer serious losses. In such a case, the buyer must see that a clause is inserted to the effect that the time of the delivery is “the essence of the contract,” and that in the event of failure to deliver on the specified date, the buyer may cancel the contract and purchase elsewhere.

Sometimes it may be necessary to include a clause providing that if the material is not delivered on time, the seller shall be liable to pay to the buyer a certain fixed amount, usually designated “liquidated damages.” Such damages, however, are not enforceable against the seller by way of punishment for non-delivery. It must be shown that the purchaser has sustained actual loss on this account.

Place of Delivery.—The question of transportation charges is often an important factor in the cost of material. It is essential, therefore, for the buyer to secure from the seller all the concessions and advantages he possibly can. It must be borne in mind that the place of delivery, or the f. o. b. point, is where the ownership of the goods passes from seller to buyer. If the agreement is “f. o. b. point of shipment,” and the goods are lost or damaged in transit, the buyer must nevertheless pay for them, although

he has never seen them or had physical possession. His only remedy lies in a claim against the transportation company.

On account of the fact that this condition governs the transfer of ownership, every buyer would naturally prefer placing all orders on the basis of delivery being made by the seller to the buyer's factory, or to the destination where the material is to be used. The attitude of the sellers, however, renders this impossible of accomplishment. It is therefore obligatory on the buyer to secure all the concessions possible, if he desires to close the transaction on the most economical basis.

When a purchase can be made "f. o. b. destination," then the buyer should insist on the seller's prepaying transportation charges. This is important because if the freight is paid by the purchaser, he has to provide finances for this purpose, and there is the attendant clerical work of checking freight bills and having in force an infallible system by which these charges are debited to the seller.

Many transactions are closed on the basis of "f. o. b. point of shipment," with partial freight allowance or full freight allowance to destination. This is done by the seller to relieve himself of responsibility for the material in transit; it also enables him to meet the competition of other sellers who are more favorably situated geographically. Even in those cases in which arrangements are made "f. o. b. point of shipment," with no freight allowance, it is sometimes possible to induce the shipper to prepay freight. If a purchaser can make such an arrangement he has

gained an important concession, for he is getting the seller to carry and finance his freight bills.

Terms, and Time of Payment.—When any one is negotiating for a purchase, the price is naturally the main consideration and the point on which the greatest stress is laid, but there are some minor points connected with every order placed, to which attention should be directed. Although they are subsidiary to the major point, it must not be inferred that they are of little importance. In many cases it will be found that even if these points are secondary, many economies in buying can be effected through a study of them. In short, no good buyer can afford to ignore them, for they may have an important influence on the merits of his purchases and on the efficiency of the service that he is able to render his concern.

In spite of the fact that in connection with certain lines of goods and in certain trades there are established rules and terms which are supposed to be strictly adhered to, nevertheless they are deviated from; and in other transactions, in which no fixed rules abound, the buyer and seller are always free to arrange terms. This fact goes far toward determining the economy of a purchase, and large use can be made of it by the purchaser in closing a negotiation. For this reason, a study of this feature is essential to good buying.

Any establishment that is in a strong financial position can effect savings by taking advantage of all cash discounts secured by the purchasing agent, and can at the same time place a strong weapon in the agent's hands by enabling him to conduct his nego-

tiations on the assured basis of the cash being ready at any moment to take care of the obligations he is incurring for the concern. A knowledge of this fact will naturally attract the best there is in the market, and will save the purchaser the considerable work of searching for sources of supply. Another advantage is that whenever there is a bargain to be offered for sale, it will undoubtedly be presented first to those houses that are in the best financial position.

It would seem, then, that the buyer who is not backed up with substantial finances is laboring under great disadvantages. To a certain extent he is, but this is a reason why he should use greater energy and put forth every endeavor to secure terms fully as advantageous as those secured by his more favored contemporary. This cannot always be done, but by means of skilful trading and clever and judicious negotiating much can be accomplished. A purchasing agent who is placed in such a position, and who is able to secure for his company the best terms, is indeed a valuable asset.

It is not the regular terms recognized and allowed in many lines of business that I wish to emphasize. It is assumed that these can be obtained by every purchasing agent, practically without asking, but it is when special purchases are made and special terms arranged, and when better terms can be secured than those generally recognized as regular, that an actual saving is made.

The time element is also an important factor, particularly with those concerns that work on a limited amount of capital. In such cases a buyer can be of

considerable value if he can arrange payments on long time; but if this has to be done at a sacrifice of price or cash discount, no saving will be effected. It is therefore of paramount importance to secure, first, the lowest price, and then the longest time or the largest cash discount. After every possible concession in the matter of time and discount has been secured from the seller, a review of the financial position of the buying concern will determine on what basis to close the negotiation. If facilities are available for borrowing money at the usual recognized commercial rates, it will invariably be found that it is economically advantageous to borrow, and to secure the cash discount rather than buy on extended time.

A study of these various problems is a science, and even small establishments may derive considerable benefit by giving close attention to them.

Cash Discounts.—Discussions have taken place in regard to cash discounts, and tentative movements have been initiated with the object of entirely eliminating such discounts, but very little has been accomplished in the way of making the practice uniform throughout all classes and sections of business, although in some lines it has been put into effect and rigidly adhered to. Opinions differ greatly as to the wisdom of the entire elimination of cash discounts, but there is one positive conclusion: namely, that if all cash discounts were abolished and all goods sold on the basis of payment in, say, thirty days, some concerns could pay but others could not. The result would be that those that could not would be penalized to the extent of what it would cost them to borrow

the money from their banks to make the payments. This drawback might not be so expensive as the loss of cash discounts under the present system, but it would be a heavy handicap.

Buyers, however, have to deal with the conditions as they are, and not with a theory. It is well, therefore, to note a few instances of what it actually means to a business when cash discounts can be arranged with the seller. Granted that thirty days is the net time for payment, if the seller is willing to allow one half of one per cent for cash in ten days, it means that he is willing to forego this percentage to obtain his money twenty days earlier, which is equivalent to over 9 per cent a year, one per cent for the same period is just double this, and two per cent is over 36 per cent a year. If the net time is 60 days, these percentages, of course, decrease materially but are still an important item.

It would seem that these illustrations prove conclusively that important savings can be effected by borrowing money at, say, six per cent in sufficient amount to pay all bills less the cash discount. But the fact must not be overlooked that the precise amount cannot be borrowed for the exact time between the discount date and the maturity date of an invoice. Therefore a certain amount of borrowed money will be idle, but not in sufficient amount to offset the advantages gained.

Probably no business custom has given rise to more arguments and discussions than that of giving cash discounts. Strenuous attempts have been made by some to abolish the custom entirely, and by others to

perpetuate it. Many claim that such a discount constitutes a price concession by the seller, others that its use should be retained because it is a valuable aid in making collections. Some claim that the discount is a benefit to the small trader and manufacturer because he can by means of it get his money in quickly for goods sold and turn his capital over oftener than if he received no discount. In opposition to this argument, it is claimed that the discount benefits large buyers only, because they are generally in a position to take advantage of the cash discounts, while a smaller buyer is not.

However the custom of granting a cash discount is considered, there is no doubt that it is greatly abused. Nevertheless it exists, and certainly the purchasing agent cannot ignore it. It is sometimes called a form of price-cutting; if it is, then the purchasing agent is entitled to the credit of getting the concession.

The question is receiving so much attention principally because of the abuse of the privilege that is involved. But as soon as the word "privilege" is used the question is raised as to whether the discount is a privilege or price concession. The usual cash discount is equivalent to a very excessive rate of annual interest, and for this reason it is not to be supposed that any seller labors under the illusion that he gives a cash discount to aid his collections. No business man would sacrifice 18 per cent a year for this object. Perhaps, after all, the only cash discount that is fair in principle is that of a fair rate of interest for anticipated payment. The discussion could be continued almost indefinitely. The abuses which exist are not

caused, as a rule, by the purchasing agent, but by those responsible for the finances of a concern. I shall say more on this phase of the subject when I treat the subject of invoices.

From the purchasing agent's point of view, since the custom exists he should get the best terms he can obtain, irrespective of whether it is designated a cut in price, a price concession, or a privilege graciously extended by the seller. But he should remember this—nothing is gained by inserting in the order, or contract, any mention of the discount. He must make some provision for taking advantage of it, by getting invoices approved promptly. Moreover, he must not overlook the fact that if the material has to come some distance it may be necessary, in order to secure the cash discount, to pay the invoice before he receives the material.

When the terms of an order, or contract, are definitely agreed upon, neither party has any right to modify or change them. They should be just as strictly adhered to as the unit price. It is a common practice of some firms to deduct cash discounts after the agreed date, and of others to pay an invoice sixty days from the date, instead of thirty as agreed. These derelictions react upon the buyer, and curtail the efficiency of the service that a purchasing agent can render his concern, because they have a decided effect on the attitude which the seller adopts in his dealings with the buyer.

Contracts and Orders.—Throughout this chapter I have referred to contracts and orders as if the terms were synonymous and represented exactly the same.

thing. This is true to a large extent, but there is a distinction. All the points that have been discussed apply equally to any agreement reached between buyer and seller, irrespective of its final form. It may have been entirely verbal, or it may have been represented in the documentary form of an order or contract—the distinction lies in the written forms. A contract form, in duplicate, is signed by both parties to the transaction. An order—which appears on an order form—is really a “command” from the buyer to the seller to proceed to make, ship, or deliver certain goods for which the buyer has received a quotation. In other words, it is an acceptance of the seller’s offer. The quotation and the order constitute the contract. The virtue of this method lies in the ease and simplicity of its execution. It is universally adopted, except in those cases already alluded to, in which the transaction is more intricate and involved and demands an elaboration in written evidence.

No matter what form the documentary evidence takes, the fact remains that every arrangement or agreement made between buyer and seller is a contract, and is in force until carried out in accordance with its terms, or until mutually abrogated.

Contract Forms.—As already stated, what is usually designated as a contract is drawn up in such a manner as to require on the document the signatures of both parties. This form is very largely used by industrial establishments for what are generally called “blanket orders.” This term is self-explanatory. The blanket order literally covers the buyer’s requirements, or part of them, over a certain period,

and delivery of the material can be called for by the buyer at will, or at definite times stated in the contract.

These blanket orders have many advantages and can be drawn in many forms. Some of the advantages are: protection in the matter of price for the period covered; generally the securing of a better price than for separate purchases; a saving in time in not having to secure quotations for each individual item; greater uniformity in quality, because the supply comes entirely from one source. Depreciation in price during the contract period is an important question in all blanket contracts, and should have the buyer's serious consideration. In most cases it is not difficult to obtain protection against this from the seller. By a study of market conditions, as discussed in the last chapter, large use can be made of this method of buying on an advancing market, but more care should be exercised at other times.

These contracts are of so many kinds, or rather there are so many ways in which they can be drawn to accord with any agreement reached, that it is impossible to give illustrations of all of them. One form, given in Figure 15, will suffice to indicate their general character. The following is a brief description of some of those more commonly used:

1. The buyer agrees to take all his requirements during the period named.
2. The buyer agrees to take part of his requirements.
3. The seller agrees to furnish a stipulated quantity,

JOHN SMITH MFG. CO.	
100 16TH AVE. N. Y.	
SALES CONTRACT IN DUPLICATE	
QUANTITY	JOHN SMITH MFG. CO. hereby sells and the _____ hereby purchases and agrees to receive and pay for the following at the price and upon the terms herein specified and subject to the conditions herein expressed, to be specified for between _____ and _____ the expiration date of contract, not to exceed _____ nor to be less than _____ of material within the limits and of the size manufactured by seller and subject to seller's standard manufacturing variations, classifications and extras.
DESCRIPTION AND PRICES	The price or prices quoted herein are based upon the published _____ freight rate subject to prescribed minimum weights, lengths, and minimum charges from _____ to destination, lawfully in effect at date of this agreement, viz. _____ cents per 100 lbs. No freight allowance in excess of actual weight to be made. Shipments of less than 100 lbs. to be invoiced f. o. b. Seller's mill. In event of an increase of such freight rate the amount of such increase shall be added to the price of all materials shipped against this contract during the period in which such increased rate is in effect, and in event of a decrease in such freight rate the amount of such decrease shall be deducted from the price of all materials shipped hereunder during the period in which such decreased rate is in effect.
TERMS OF PAYMENT	Terms from date of invoice, payable in Pittsburgh, New York or Chicago funds. In case buyer shall fail to make payments in accordance with the terms and provisions of this agreement, seller may defer further shipments until such payments are made, or may, at its option, terminate this agreement. Shipments and deliveries under this agreement shall at all times be subject to the approval of Seller's Credit Department; and, in case seller shall have any doubt as to Buyer's responsibility, Seller may decline to make any shipments hereunder except upon receipt of satisfactory security or for cash before shipment. Termination of the contract under any of these conditions shall not prejudice any claim for damages the seller may be entitled to make. All transportation charges to be paid in cash by buyer.
SPECIFICATIONS	Specifications in detail shall be furnished to the Seller in substantially equal monthly quantities beginning _____ day of _____, 19____. The Buyer's failure to furnish specifications as appointed may, at Seller's option without notice to Buyer, be treated and considered as a refusal to specify and receive the unspecified portion of the monthly quota. Final specifications due under this contract to be in the hands of the Seller at least thirty days prior to the expiration date of this contract. The seller shall afford at its works reasonable facilities for inspection and tests of material when sold and accepted subject to inspection. Inspection and acceptance at seller's works shall be final. Shipments to be made as soon after receipt of specifications as condition of seller's plant will permit.
DELIVERIES	Goods to be delivered f. o. b. cars at _____ consigned to _____
QUARANTY	The Seller agrees to replace material found defective for the purpose for which it is sold, when in the hands of the buyer, but will not allow or pay any claims of any nature whatsoever resulting from the use of such defective material. In all cases full opportunity shall be given for investigation by seller's representatives. Goods must not be returned except by written permission of the seller.
CONDITIONS	The Seller shall not be liable for non-performance of this contract in whole or in part, if such non-performance is the result of fire, strikes, differences with employees, casualties, delays in transportation, shortage of cars or other causes beyond the Seller's reasonable control; nor shall these exemptions be limited or waived by any other terms of this contract, whether printed or written. The quantity of material shown by invoice shall in all cases govern settlements, unless notice of shortage be immediately reported to the agent of the delivering railroad, in order that the alleged shortage may be verified and unless like notice be given to the seller within 72 hours after receipt of material. Claims for other errors, deficiencies or imperfections will not be entertained by the Seller unless made within 15 days after receipt of material.
ACCEPTED:	ACCEPTED SUBJECT TO APPROVAL

FIG. 15. FORM OF CONTRACT

with no binding obligation on the buyer's part to take any definite quantity.

4. The price may be a fixed one for the whole period.
5. The price may be on a sliding-scale basis, increasing or decreasing in a ratio proportionate to quantities taken.
6. The price may be at a percentage below the current market when material is taken.

In each of these instances the material may be taken in one shipment or in many; if it is taken in one shipment the transaction could in many cases be effected through a regular order. What is of primary concern to the purchasing agent is the proper insertion in the written document of all the clauses necessary to cover the agreement he has made with the seller; he should concentrate his attention on these clauses before signing the contract. If inspection is to be made at the seller's factory during the time of the manufacturing process, or if chemical or physical tests are to be made then or subsequently, the contract should be drawn to incorporate them.

When a contract covers many shipments over a long period, the best way to deal with them is to issue for each shipment a regular order which shall contain a clause to the effect that it is on account of contract dated——. The following up, invoice work, and other details are then kept in conformity with other routine work; these I shall discuss under that heading in a later chapter.

Regular Orders.—Under what may be classed as regular orders are included the majority of purchases

for industrial purposes. In those instances in which failure on the part of the seller to live up to the agreement would involve serious consequences for the purchaser, it is advisable to send the order in duplicate, and to insist that the seller write his formal acceptance on the face of one copy and return it to the purchaser. Examples of forms for these orders are given in Figures 16 and 17. It is essential that the nine cardinal points mentioned earlier in this chapter, as well as all other pertinent information, be embodied in the order.

As previously stated, an order that is issued in acceptance of a proposal made to the buyer serves to complete the contract, provided the order does not deviate from the offer in any particular. An order which is issued by the purchaser, and which does not come within the last named category, is simply an offer to the seller; an acknowledgment is therefore necessary for the completion of the contract. Some purchasing departments issue a great many of these orders—it must be left to the individual cases to determine whether acknowledgments should be required, and, if so, when.

Many order forms have the text of the conditions printed on the reverse side. In such cases it is essential to refer in the body of the order to these conditions, in some such phrase as this: "This order is issued subject to the conditions on the back hereof." If there is no reference to these conditions within the space which could be considered as containing the essential facts of the order, the seller is not obligated to read and interpret them as part of the contract.

All invoices, correspondence and packages must bear this ORDER No.

JOHN SMITH MFG. CO. ORIGINAL
100 SIXTEENTH AVE.
NEW YORK

To _____

Please enter our order for

Price _____ John Smith Mfg. Co.
Ship Via _____ Purchasing Agent
F. O. B. _____

We will not be responsible for goods delivered to us with out a written order.
Please acknowledge receipt, and advise when shipment will be made

FIG. 16. ORDER FORM

“Rush” Orders.—Some of the expressions used in connection with “rush” orders are: “The ‘bête noir’ of a purchasing department; “A necessary evil;” “There should be none.” Every rush order means a rush price or no price at all. The barriers carefully erected against paying high prices are swept away. Because somebody has blundered? No, not always. There can be legitimate rush orders, and it is the duty of the purchasing department to be prepared for

JOHN SMITH MFG. CO. 100 SIXTEENTH AVE. NEW YORK		Put this Order No. on Your Invoice _____
To _____ _____		
Please detach and return acknowledgment at foot		
Quantity	Description	Price
Ship Via. _____ F. O. B. _____		John Smith Mfg. Co. _____ Purchasing Agent
Detach and mail at once to JOHN SMITH MFG. CO. 100 Sixteenth Ave. New York		Order No. _____ Date _____
Receipt of Order numbered as above is hereby acknowledged. We accept the order as specified		
Shipment will be made _____ Signed _____		

FIG. 17. ORDER FORM, WITH ACKNOWLEDGMENT SLIP ATTACHED

For those orders, for which acknowledgments are essential, this is the surest way of getting them and brings better results than separate acknowledgment forms.

them. This state of preparedness consists in knowing sources of supply and in having a thorough knowledge of prices. These phases of the subject were discussed in the second and third chapters.

Such orders may originate through the necessity that the manufacturing department produce on short notice some contract closed by the sales department

with a time limit clause. Even if there have been lax methods, or lack of anticipation, on the part of another department, still the purchasing department is in existence for the general good of the organization and should exert all its energies to do the best under the circumstances. If it is a case in which intelligent anticipation would have obviated the rush order, it is certainly part of the purchasing agent's duties to call the matter to the attention of the proper authority. Buying on sane, careful principles should be insisted upon, and the purchaser should work for the elimination of all those factors that tend to nullify or destroy these principles. This is the purchaser's view of the cost situation in an industrial plant.

"Pick-Up" Orders.—A great deal of what has been said under rush orders could apply to "pick-up" orders, but there are some other considerations also. There are times when a mill shipment is delayed from one or another of many causes—excessive demand, strikes, break-down of transportation, and so on. In such instances it is necessary to "pick up" from warehouse stock sufficient material to keep the series of factory operations unbroken. An advanced price must undoubtedly be paid, and in keeping this at a minimum the purchasing agent's price knowledge again comes into play.

Another class of pick-up orders is in connection with small, picayune purchases which, taken alone, would be declined by even the smallest of the dealers and supply houses, but which, in conjunction with other business, help to make a fairly respectable account for some merchants and jobbers.

The main evil of small pick-up orders is well illustrated in a letter to a technical publication from "A Victim." He relates that he received a pick-up order from a large corporation for two dozen cotter pins. A price of \$1.50 was agreed upon when the order was telephoned. The company's order called for shipment to an outlying branch by parcel post. A copy of the invoice and of the original shipping list was to be mailed to the branch, and the invoice in quadruplicate with a copy of the shipping list was to be mailed to head office.

The clerk responsible for checking the price on the invoice was under the impression that it was too high, and therefore obtained quotations from two other houses. Both of these quotations were lower than the shipper's price. Armed with this information, he opened fire on the dealer and after four letters had been written and despatched by each of the combatants, the dealer capitulated and reduced his charge to a figure in line with the other quotation he had received.

In the case recited, perhaps several times the amount of the saving was spent by the purchaser in securing the adjustment. The remedy for such a condition lies in dealing with tried and reputable supply houses. A house that habitually renders invoices containing overcharges is not safe to do business with. The ultimate cost of purchased goods is not represented by figures on an invoice. Possibly the example given is an exaggerated case, but it shows the need of common sense in buying small quantities as well as large.

“Covering Orders” for Recording Purposes.—
“Covering orders” are necessary to enable the purchasing department to keep a record of the charges, and also to guarantee that invoices and bills of every kind will travel the same course before reaching the accountant. They also constitute a measure of protection against duplication of payments, as I shall explain in the chapter on “Invoices.”

These “covering orders” are written up and included in the purchasing files for the invoices to be recorded on them. They consist chiefly of such items as of electric-light bills, telephone charges, and many other monthly bills. Probably every purchasing department at times receives bills for small items obtained by some person in the establishment, for which no formal order has been issued. Stationery and small items of merchandise are sometimes picked up in this way. These must be covered by formal orders for recording purposes only.

Remedial Contract Forms.—The National Dry Goods Association has appointed a committee, composed of both manufacturers and jobbers, to discuss forms of contracts as a remedy for some of the anomalies that now exist. The object is so extremely pertinent to the discussion of the subject in this chapter that I give here the report of the proposed meeting which the New York Times published.

The suggestion of such a meeting was made some weeks ago by E. L. Howe, Secretary of the retailers’ organization, in a statement calling attention to the need of more definite and binding contracts between buyers and sellers. Mr. Howe said there should be a different understanding than existed be-

tween the two parties as to the obligations imposed upon both by a contract for the delivery of merchandise.

"Our suggestion, therefore, is," he said at that time, "that immediate attention be given by both the retail and wholesale interests of the country to a form of contract for merchandise orders that will place proper and binding obligations on both parties to it. As it stands today the retailer is bound to acceptance of the goods if shipped within the specified time, but the seller slips out of his obligation as easily as he slips out of his coat. If the seller cannot be tied definitely in the matter, provisions should at least be made for notification to the buyer, at a reasonable time prior to the stated delivery, of the seller's inability to go through with the contract."

This exposition of the buyer's side of the contract controversy brought a quick reply from the manufacturers, who, in turn, claimed to be the parties with a real grievance. Many instances were related of the buyer's failure to live up to his contract with the seller, of his taking unjustified discounts, returning goods without a proper reason, cancelling orders given after goods had been put into work, and many other abuses. Many wholesalers have seen fit, during the prevalence of a market in favor of the seller, to correct some of these evils. It was quite openly hinted that the retailers were growing restless under the necessity of strictly observing the seller's terms or getting no merchandise.

"The present tendency seems to be," he said, "entirely in the direction of binding the buyer and letting the seller off scot free. Both should be tied down specifically to the performance of certain obligations, otherwise there is no contract. The seller at present seems free to deliver whenever he wants to, and at any price he cares to ask. Take, for instance, a form of contract that one importer is forcing his customers to sign. We have had copies of this contract for distribution among our members. Here are the terms laid down:

'Seller may delay or cancel all or part of deliveries in case of damage to mill, machinery, or stock, strike, accident, or delay in manufacture or transportation, inability to deliver or hindrance by reason of conditions occasioned by war or other circumstances beyond seller's control.

'If conditions occasioned by change of tariff and United States customs regulations or decisions, or by war or political disturbance increase the cost of raw material or processing of merchandise to seller, buyer shall pay proportionate increase in price upon all merchandise to be delivered.

'Seller may decline to make any or all deliveries, except for cash, and if buyer omits to pay cash for any instalment upon the date fixed for delivery thereof, upon the offer of the seller to deliver such instalment on such date for cash, then the seller may, at his option, cancel as to any or all instalments, or postpone deliveries until such time as buyer satisfies seller as to his financial responsibility, at which time seller may renew deliveries with such extension of time as seller may require by reason of postponement.

'Partial deliveries accepted by buyer shall be paid for at specified price and terms. Reasonable allowance of time from delivery date specified shall be allowed seller. Seller makes no warranties surviving acceptance. If any pieces delivered by seller are imperfect, buyer shall, within reasonable time, give seller reasonable opportunity to replace such pieces.

'Failure of seller as to any instalment shall not affect buyer's obligation as to other instalments. If buyer fails to accept any instalments when due, or to make any payment when due, or to perform any term of any contract with seller, seller shall at any time thereafter have the right to cancel all or any instalments of this contract. This paper contains the entire contract. There are no oral representations or warranties by seller affecting this contract.' "

"The provisions in this contract," Mr. Howe explained,

“show what seems to be lack of intention upon the part of the seller to bind himself to any definite obligation, yet at the same time providing that the buyer shall be held to a strict responsibility. Such contracts are not contracts in the strict sense, because they are one sided and unfair to the buyer. Such forms represent a condition in trade we hope to change as a result of the coming conference between buyers and sellers.”

CHAPTER VI

DELIVERY

Importance of a Definite Delivery Date.—Probably no phase of purchasing work requires more keenness and close attention than that connected with delivery. Very few purchases are made for industrial establishments with an indeterminate delivery date. Practically every order issued is for material or supplies required at once, or at least at a fixed date.

The determination of the date on which raw material is required, is an important factor in industrial economies. Raw material is a form of wealth, and all wealth is in a stage of appreciation, depreciation, or stagnation. One of the objects of human activities in industrial organizations is to increase the value of the raw material manipulated. During transit, and while at rest in the stores, raw material is considered to be in a state of stagnation. Contemporaneously with these periods there may be an appreciation in intrinsic value, but this is not the primary object of purchasing for industrial purposes. There may also be depreciation, on account of miscalculation or from causes beyond the control of the buyer.

Taking the form of bulk, needing storage space, and being subject to loss by fire, damage and depreciation, an expense is naturally involved in car-

rying any stock of raw material. For this reason a very close approximation is necessary of the date on which the material is required by the production department, and of the time that will be consumed by the purchasing department in procuring it. A purchase having been made on certain calculations of time as one of the principal factors, it is essential to see that these calculations do not miscarry—otherwise the whole fabric of good purchasing might collapse.

Co-operation Between Purchasing and Production Departments.—Since it is the particular province of the purchasing department to be well-informed on market conditions, it is obligatory on that department to keep the manufacturing department posted on all changes in delivery conditions. In times of stress and unusual demand, it is necessary to keep very close watch on all questions that would influence the time required to obtain raw materials. It may not be exactly true that there is perhaps a shortage, or that manufacturers cannot make shipments as promptly as when conditions are normal, but the transportation problems must also be closely studied.

Purchasing agents sometimes achieve the improbable, but they cannot accomplish the impossible. They must be given sufficient time to obtain raw material, and due notice of quantities and of time of requirement should be furnished by the manufacturing department. Co-operation between the two departments is essential—the buyer must keep the shop acquainted with delivery conditions. Foresight is the great factor in securing a supply of raw material at exactly

the right time. If it is necessary to look ahead six months instead of two, it must be done. The shop should make known its requirements at the moment they become known, and not wait till the moment of actual need.

If these matters are not handled right, the results, from a purchasing point of view, are disastrous. Prices are shunted to one side, quality in many instances is disregarded, specifications are endowed with elastic traits, and substitutes of unknown calibre are accepted or tried out. All these features are the result of lack of foresight. To the purchasing department is delegated the task of securing delivery, and the production department wants materials and supplies, not excuses for non-delivery.

Delivery and Production Costs.—Increased manufacturing costs are too frequently caused by the additional cost of raw material which has been bought in a hurry from warehouse because mill shipments have not arrived at the estimated time. If the production department has been in the habit of getting certain raw material in, say, six weeks from the time it was requisitioned, it is a distinct shock to that department to discover suddenly that it will have to wait, say, ten weeks. It should, however, be no shock to the purchasing department that has its finger on the pulse of the market.

All the principal items used in manufacturing should be scheduled by the purchasing department, and regular notification should be sent to the production department concerning the time required for delivery. Special notice should be sent in regard to any

radical changes in orders. This procedure enables the manufacturing department to specify its requirements and to prepare requisitions early enough to avoid tardy deliveries. In discussing stores problems later on, I shall say something more with respect to the quantities which should be kept on hand, and how these quantities are governed by market conditions.

In some establishments in which an article is bought infrequently, such an article is apt to be considered unimportant in the general scheme of delivery. Requisitions will be sent to the purchasing department for the principal material required for turning out a product, while the order for the article that is considered unimportant is left to be included in later requisitions. As a matter of fact, it may take longer to obtain this article than to get the other material, and delay in securing it will hold up the completion of the manufacturing process. Such cases need to be watched carefully by the purchasing department.

Buying on Schedule.—"Dependent sequence," which I have just described, is nowhere more costly in delay and inconvenience than in getting delivery of material and supplies, and any follow-up system that will bring together the various units at the right moment are always welcome.

A suggestion is given in Figure 18 for a time schedule for the purchase of all materials and supplies. A copy of this schedule should be given to each department that draws requisitions. This form needs little explanation, but it is essential that each item be given for which there may be requisitions. No general

ARTICLE	Time required for delivery if ordered from		Min. quantity which can be purchased at min. price		Special Features
	Warehouse	Mill	Warehouse	Mill	

FIG. 18. LOOSE LEAVES OR CARDS CAN BE USED, AS FOUND MOST CONVENIENT, FOR COMPILING THE SCHEDULE OF THE TIME REQUIRED FOR SHIPMENT. THIS SCHEDULE SHOULD BE FURNISHED BY THE PURCHASING DEPARTMENT TO THE PRODUCTION MANAGER OR OTHER PERSONS MAKING REQUISITIONS.

titles, such as "Hardware," "Chemicals," and so on, should be used. If such a schedule is carefully worked out by the purchasing department, it will serve as a valuable help to all those authorized to draw requisitions. If the production department maintains "control boards," or diagrams of their operations, these schedule dates should be transferred to the boards or diagrams. The fixing of standard times for purchasing and stores-handling not only allows the purchasing agent time to bargain, buy, and deliver, but is an important economic factor in preventing over-buying and over-stocking. Barring accidents and other unavoidable causes, it also prevents delays.

Transfer of Ownership.—As explained in the last chapter, ownership passes from the seller to the buyer at the delivery point named in the contract. The

seller's responsibility ceases when he has made delivery as stipulated, and it might be inferred that at this point the buyer's responsibility commences. This, however, is far from being the case. In fact, there is generally more work involved in getting delivery than there is in tracing the goods from the delivery point to destination.

Inasmuch as the delivery point may be hundreds of miles from the destination, there are two distinct phases of this work. The first phase consists of some form of following up the order, keeping track of progress made by the seller, bringing pressure to bear when necessary, and using all legitimate means to get the material to the place of delivery and at the time of delivery agreed upon. In short, it involves enforcing the clause in the contract covering this point and securing ownership in the goods. As already stated, however, ownership may pass to the buyer at a considerable distance from the ultimate destination; further work is therefore necessary while the material is in transit.

Traffic Work.—The second phase of the work, transportation, involves a knowledge of traffic problems. Some large corporations are compelled to maintain extensive traffic departments, chiefly for the benefit of the sales departments, because they sell much of their product "f. o. b. destination," and therefore the responsibility is on them to trace and follow their shipments. Some of them may have factories and warehouses located at widely separated points, between which movements of freight are constantly taking place.

In many industrial establishments, however, the product is sold entirely "f. o. b. point of shipment" and consequently there are practically no traffic problems connected with the selling end, the only work of this character is connected with incoming freight. Therefore, in these cases it usually devolves on the purchasing department to take care of the work within its own organization. I shall discuss this subject more in detail in this chapter.

Follow-Up Work.—There are innumerable schemes and devices in use for following up and getting delivery of goods. While some of these are in general use and fairly well standardized, it is probably an impossibility to find two systems that work on identical lines. The object is to get the goods, and the methods adopted by one concern rarely fit the conditions surrounding the work of another; some variations in details will always be found. In the discussion of routine work I shall outline plans for following up purchases, and these can be used as a framework on which to erect any structure for solving individual problems satisfactorily.

The basis from which to start all follow-up work is the delivery date named on the order, and the greatest factor is the reliance that can be placed on promises. If performances could bear an exact relation to promises, the problem would be greatly simplified. In the discussion, in Chapter III, on selecting sources of supply, particular emphasis was laid on this question of promises and performances. It is at the delivery stage of purchasing that the value of selecting right sources is manifested. There are many manu-

facturers who would no more think of evading a promise in regard to time of delivery than they would think of trying to change the price on an accepted order. Unfortunately, however, there are also many who cannot withstand the allurements and inducements of booking more business than they can properly undertake and still give their customers satisfactory service.

It is just such contingencies as the last named against which the purchasing agent must be on his guard; he must formulate some scheme for getting his own goods shipped on time. In work of this character, the suppliers should never be approached with unnecessary requests for information and other forms of petty annoyances; if they are, the very object sought will be defeated. A busy concern that is doing its best to satisfy customers does not want to be pestered with such things, and if they are constantly annoyed they will not give proper attention to legitimate inquiries. Intelligence must be used in the purchasing department in the handling of these matters.

In addition to the stereotyped forms which are usually sent out, and which serve for the intended purpose up to a certain point, there should be some well-directed letters that will bring the desired results. These can be supplemented by visits to the vendor's warehouses and factories. It is the practice of some large corporations to keep men permanently on the road following up purchases, and ascertaining the progress made in getting out the product, if it is a manufactured one. In times of stress and unusual activity this course is adopted by a great many con-

JOHN SMITH MFG. CO. 100 SIXTEENTH AVE. NEW YORK			Copies to _____ _____ _____
Progress Report			
Order No.	Date of Order	Date Promised	
Material	Name of Supplier		
Date of Investigation	Place of Investigation		
Investigation made by	Date report sent in		
NATURE OF REPORT			
Signed _____			

FIG. 19. FORM FOR TRAVELING MEN TO USE IN REPORTING PROGRESS OF ORDERS. AS EXPLAINED IN THE TEXT, IT IS AN ESSENTIAL PART OF THE FOLLOW-UP SYSTEM OF MANY CONCERNS TO HAVE THEIR REPRESENTATIVES VISIT THE SELLERS' FACTORIES AND WAREHOUSES.

cerns. At any time when great importance attaches to delivery of material this method should invariably be used, for it is undoubtedly the most effective means of getting the desired results. Some illustrations of follow-up forms are given in the chapter on "Routine Work." There should also be standard forms on which the travelling men may make their reports, similar to those shown in Figures 19 and 20.

INSPECTION REPORT				Copies of this report sent to
Made by _____			_____	
TO JOHN SMITH MFG. CO.			_____	
Material _____				
Purchased from _____			Date material was ready for inspection _____	
Order No. _____	Date of Order _____	Date material was ready for inspection _____		
Place of inspection _____	Date of inspection _____	Date sent in _____		
DETAIL OF INSPECTION AND TESTS				
				Signed _____
Report approved by _____			Date of approval _____	

FIG. 20. INSPECTOR'S REPORT FORM

Several copies of this may have to be made, and sent to interested parties.

Emergency Orders.—Every purchasing department at some time or another issues rush, or emergency, orders; these cannot be handled by means of the regular follow-up system. The manner in which they should be handled depends on the number of orders—some departments have to issue many more than others. The best plan is to have extra copies of the orders made, and to keep them continually in a prominent place so that they will get daily attention until

disposed of. It is sometimes advisable to have the original order rubber-stamped "Emergency," in large letters, and sent by special delivery. These methods invariably secure prompt attention for the order.

Helps in Getting Deliveries.—The prompt return of cars and of all returnable containers is a factor in getting better delivery; giving close attention to these matters will mean greater efficiency.

Bonus and penalty clauses are sometimes inserted in contracts with the idea of keeping deliveries up to schedule, but this procedure is seldom resorted to in buying material and supplies. It is confined almost entirely to construction work and purchases in connection with such work.

Dependable service on the part of the seller is the important feature of delivery. There are houses that can be depended upon in almost any emergency or contingency. Abnormal market conditions, labor disturbances, and transportation difficulties do not seem to disturb them, or, if they do, the concerns make good nevertheless. They do not throw up their hands and transfer the trouble to some one else. Their main object is to take care of their customers as they have agreed to do. Such service is valuable to the buyer; it is worth paying for. If he pays only what he would have had to pay another bidder he has a good bargain, for the other man might have cost him considerable time, effort, and expense in getting delivery.

Some delivery promises are made by salesmen to secure an order without any knowledge on their part as to the ability of their plant to make good on the promises. Salesmen should be fully posted on these

points. They should be able to answer accurately and authoritatively any questions regarding delivery, and should be ready to give undertakings on this score.

Inspection.—At some time and at some place all purchases must be inspected. This inspection may take many forms. The receiving clerk may make only a superficial examination, or he may have to count carefully, measure, and weigh certain materials. When goods are received at the consignee's factory, the inspection may be made independently of the receiving clerk, and the material may be put to some simple tests and possibly compared with samples or goods delivered on previous orders. I shall treat all these forms of inspection, and also the receipt of material when the destination is the purchaser's factory or storeroom, in the discussion of storeskeeping, a subject with which they more properly belong.

Inspection Before Shipment.—Many contracts are placed which contain stipulations regarding inspection before shipment or during the manufacturing process in the seller's factory. It is usual for the technical staff to specify the nature of such inspection, and to describe clearly the essential tests they wish made. It then becomes the duty of the purchasing department to have these specifications incorporated in the order or contract, and to ascertain from the sellers when the material is ready. Since the inspectors themselves may not be under the jurisdiction of the purchasing department, this department should notify the proper authority to have the inspection made.

Inspection reports—as illustrated in Figure 20, or some other suitable form—should be made out by the inspector in duplicate or triplicate, as required, and forwarded to the home office. The purchasing department should always get a copy, which should be filed with the contract papers, or else a notation of it should be made on the order.

Testing Samples.—Samples for testing purposes may be taken from shipments on arrival at destination, or they may be secured before shipment is made by the seller. Those establishments that maintain their own testing laboratories can furnish the results of these tests to the purchasing department; if this is not done, arrangements should be made with some outside concern to do this work. Both the inspection and the testing of any moderate-sized establishment can probably be done cheaper and better by one of the firms that specialize in this work. The purchasing department should buy the services of some good firm for such work as it requires done, and issue an order in the regular way. There is an advantage in having this work done outside, because the benefit of the wide experience of the inspecting firm is obtained; nevertheless, there is some difference of opinion on this score. It is contended that while a man testing only a few materials for the uses of one factory becomes a keen specialist on these few materials, he is liable to become narrow as a result of this kind of experience.

Need of Recognized Methods of Testing.—Some very large corporations maintaining extensive laboratories can enforce their own methods of testing and

sampling, but undoubtedly a need exists among the majority of industrial establishments for a bureau for testing materials and supplies according to some recognized standards. All inspection and testing should then be based on the standards adopted.

Inspection is often one of the weakest points of a manufacturing plant's operating system. It is frequently too lax, and sometimes too rigid. Exact methods ought to be in universal use—then the criticisms that sometimes arise regarding unfair testing methods could not come up.

The question as to whether inspection should be entirely under the jurisdiction of the purchasing department, or should be controlled by the manufacturing department or by a technical staff, is also debatable. The purchasing department is held responsible for obtaining the quality specified, and when material fails to check up to the specified quality, the onus of enforcing the specification is thrown on the purchasing department. It is contended that this department should therefore control testing and inspection. The point is open to argument, because the purchasing department did not originate the specification, neither is it the actual user of the material.

The determination of the question will vary in individual cases. A laboratory maintained by an industrial establishment should, in any case, be a separate entity. Its services should be at the call of any of the departments, for at some time or another any one of them may require such services. Inspection may also be dissociated in a similar way. This arrangement can be made in any establishment where

there is sufficient work for one or more men. Competent inspection of incoming goods will prevent much production loss; the time to determine whether or not the goods comply with the specifications is before, or at the moment of, arrival—not when they are needed for use, or when they are already under manipulation in the shop.

Transportation Problems.—Some establishments have a traffic manager, whose duties are restricted to looking after the outgoing shipments. Under such an arrangement, the incoming shipments have to be taken care of by the purchasing department. This should not be the case, for the traffic manager has more influence with the railroads in general than the purchasing agent. He can get quicker action and demand prompter attention to his requests than a buyer possibly could, because he controls the routing on outgoing shipments to a large extent, and exerts by this means a tremendous leverage on the operating department of a railroad through its freight agent's office. If similar work is carried on in two departments, there must be some duplication of work, also, of records, freight classifications, and other matters which strictly pertain to traffic problems.

Some buyers make a practice of issuing orders bearing the instructions "Ship and trace," indicating the desire of the purchaser that a tracer be started the same day shipment is delivered to the railroad company—in fact, before the consignment has left the freight yards. This practice is decreasing; it should be discontinued altogether.

The railroads, undoubtedly with some justification,

consign to the waste basket, many requests for tracers when the papers show that the goods have not had time to reach their destination. If formerly these premature tracers had any effect in expediting the transit of goods, they have long since lost their effectiveness. It is much better to start a wire tracer the day after the consignment is due to arrive at destination.

The railroads perform for shippers a vast amount of clerical work in tracing shipments, which comprises a very considerable item of expense in the transportation of goods. It cannot be doubted that a large part of this expense could be saved the transportation companies by the exercise of patience on the part of shippers and consignees, and by confining tracer requests to those instances in which shipments have actually gone astray or have been delayed in transit.

Before an order is placed, careful consideration should be given the question whether shipment should be made by parcel post, express, or freight. The date on which goods are required will be the determining factor in some cases. It is, of course, expedient to get the material in good time, but to have it come by express and then be held in the receiving room or stores several days is an unnecessary expense, when the same lot could just as well have been sent by freight and the differences in charges could have been saved.

When reference cannot be made to an organized traffic department, the purchasing department must be in a position to check freight charges and, before placing orders, it should be able to verify the freight

rate named in the quotation of the firm that is to receive the order. This can be done through the local freight agent. The purchase order should carry instructions concerning the routing of the material to be shipped, the classification, and the freight rate which is to apply.

CHAPTER VII

INVOICES

Completion of the Purchasing Cycle.—As shown in Figure 1, the cycle of purchasing does not end with getting delivery of the material; it is incumbent on the purchaser to see that the seller obtains the consideration agreed upon. Owing to the departmental formation in establishments, the actual payments are not made by the purchasing department, but the seller's invoice is treated in such a manner as virtually to make it as good as cash to the seller at the agreed time of payment.

This work is generally looked upon as merely comparing and checking with facts already established, and although requiring care and methodical treatment it is not supposed to demand a great amount of intelligence or initiative. While it is true that care and close application are necessary, still there are some phases of the work which call for something more than mere clerical accuracy. There is no little opportunity for the man with broad knowledge and creative instinct.

When it is remembered that there are some orders against which a great many invoices are rendered, and that every order issued is responsible for at least one invoice, a better realization is gained of the im-

portance of the work connected with invoices, and of the magnitude it may assume when a great many orders are issued.

It is necessary to keep in mind the essential differences in an invoice as it first arrives in the purchasing agent's office and when it finally passes out of the office. In its initial stage it is a harmless document, but its characteristics are so altered on its passage through the department as to transform it into a document of considerable potentiality.

Work to be Done on Invoices.—There is no recognized standard method of handling invoices, or of executing the necessary work in connection with them. While there are certain features that must be adequately covered, the manner of execution is largely a matter for individual decision. It is well in any case, however, to concentrate this work as much as possible, for invoices, more than any other documents, seem liable to be misplaced and lost.

In some concerns, invoices go first to the accounting department for registration and checking extensions; in others, only extensions are checked. Sometimes the accounting department checks the invoice against receipt of material; in some cases it never reaches that department until it has been fully approved in every particular.

To simplify the discussion I propose to treat invoices on the supposition that the purchasing department has the task allotted to it of verifying quality and delivery, checking prices and extensions, classifying charges under proper headings, and finally approving for payment. The accounting department,

then, must solve the problem of distributing the amounts to the various accounts and putting the invoice in shape for payment.

Standardizing Invoices.—There has been, at times, considerable agitation in favor of standardizing invoice forms, but the movement has not made much progress. If a standard size could be adopted, it would probably bring some advantage in filing, handling, and vouchering; or at least, a standard width would help somewhat to secure these advantages. There does not appear to be any good reason for the great disparity in dimensions which now exists. Apparently there is a tendency towards uniformity, for the exaggerated sizes formerly used are slowly disappearing.

Many firms send out invoice forms with their purchase orders, and insert a clause in the order to the effect that the goods must be billed on these forms. This is a proceeding which has been much criticized, and great difficulty has been experienced in getting vendors to use the forms. The scheme originated with accountants—no practical purchasing agent would impose such a condition. All the advantages in connection with these invoices are on the side of the buyer; to the seller they are a source of trouble and annoyance, and interfere with his accounting methods. Every business house is recognized impersonally to a certain extent from its stationery, which has an advertising value to the house. That the buyer should impose a restriction curtailing this advantage is unfair, and unless the practice is made universal it will always be unpopular.

Relation of Invoices to Purchasing.—The work connected with the invoice is the last link in the purchasing chain; it has already been emphasized, in previous chapters, that each phase of purchasing work must be maintained at a definite standard to secure the greatest efficiency. The negotiations leading up to the actual placing of the order may have been conducted in the most able manner, and all operations connected with obtaining the best price, quality, delivery, and terms may have been carried through in a way which will secure to the buyer the utmost advantages; yet all this work may be nullified and the benefits lost if the invoices are not dealt with in such a manner as to insure their being permanently secured. Delay in dealing with the invoice might cause the loss of the cash discount and, in addition, the loss of the indirect and contingent advantages that accrue from the prompt approval and payment of invoices. Careless checking and examination would involve the risk of passing the invoice with inaccuracies and excessive prices, with the result that the good work previously done would be rendered valueless.

Trade Acceptances.—No discussion of invoices would be complete without some reference to acceptances. The use of these in this country is at present very restricted, but considerable publicity has recently been given to the matter. It is only a question of the custom's becoming better known to get it firmly established as a recognized part of our business system.

This type of credit instrument is in common use in

Europe. During my experience there, trade acceptances seemed to be as common as checks, and it was not an unusual occurrence to see invoices with acceptances attached. Bankers in this country are as a unit in favor of this instrument, and it only requires education and knowledge of its use to secure its general adoption by all business interests.

The form of an acceptance does not vary any more than the form of checks; an illustration of the wording of one is given in Figure 21. The acceptance should always include the statement that it is given to cover the purchase of goods. The method of procedure in connection with these acceptances is somewhat similar to that of attaching a draft to a bill of lading for export shipment, but there are many points of difference.

The advantages in using this instrument must be mutual, and inducements must be offered to buyers

Accepted _____ 191- Payable at _____ (Name of Bank) _____ (Address of Bank) _____ (Signature of Buyer)	<div style="display: flex; justify-content: space-between;"> <div> \$ _____ Name of Seller _____ Address _____ </div> <div> No. _____ Date _____ </div> </div> <div style="margin-top: 10px;"> _____ Days after date pay to the order of _____ <div style="text-align: right;">Name of Seller</div> </div> <div style="margin-top: 10px;"> _____ Dollars </div> <div style="margin-top: 10px;"> This acceptance is given to cover value of goods received. </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> _____ Name of Buyer </div> <div> _____ Name of Seller </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> _____ Address </div> <div> By _____ <div style="text-align: right;">Treasurer</div> </div> </div>
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FIG. 21. FORM OF AN ACCEPTANCE. DEVELOPMENTS IN THE NEAR FUTURE MAY BRING THESE INTO LARGE USE.

to get them to execute acceptances instead of leaving an account open. It will, no doubt, become the custom to make stipulations regarding acceptances when agreeing to the terms in closing a contract, but as terms are at present arranged negotiations would work out along some such lines as the following:

1. When goods have been sold on the basis of 30 days' net, 1 per cent cash 10 days, the giving of an acceptance by the buyer would entitle him to 60 days' net; or 1 per cent discount on giving a 30-day acceptance.
2. Goods sold on the basis of 60 days' net, 2 per cent cash 10 days, would entitle the buyer, on giving an acceptance, to go 90 days' net; or he would receive 1 per cent discount on giving a 60-day acceptance.
3. Goods sold on the basis of 90 days' net, 2 per cent on the 10th prox., would entitle the buyer, on giving an acceptance, to 120 days' net; or he would receive 1 per cent on giving a 90-day acceptance.

These periods and discounts could be altered to suit any arrangement; even the maximum cash discount could be given in some cases with the maximum time, provided an acceptance were given by the buyer promptly.

In any arrangement such as indicated for giving acceptances there is an apparent advantage to the buyer, but there are also many compensating advantages for the seller. Business houses carry many open accounts that are vague and indefinite concerning the time

when a settlement will be obtained. As assets, these accounts are to a certain extent intangible—at least the seller has nothing to show for them except an entry in his books; but acceptances have a definite value. They are, in fact, as good as cash, for any bank will discount them in preference to promissory notes, and probably at a lower rate. Moreover, they make a clean-cut, definite settlement between the buyer and seller from which there is no redress. Now that acceptances are coming into use, it will not be necessary for so many houses to carry their customers, and in many cases practically to finance them.

If a concern has a large number of slow-pay customers, they are a big expense to the business and must necessarily cause an increase in the cost of goods. The result is that the prompt payer is penalized. The trade acceptance will equalize conditions, and will also prevent the making of unjust and unfair claims. It will mitigate many of the evils connected with cash discounts, and will bring about better and easier collections. These are only a few of the benefits that will be derived from the use of the acceptance. As it will undoubtedly come into more general use, and since it is closely associated with invoices, purchasing agents should make themselves acquainted with its uses and advantages, for the time will come when those buyers who are willing to give an acceptance will be given the preference by the sellers over those who are not.

Arranging Dates for Payment of Invoices.—When a purchasing department is receiving a large number of invoices from one concern every month, it can fre-

quently arrange for specified dates on which to pay them. Especially is this the case if they are for small amounts, and at the same time secure the maximum cash discount. When the cash discount is for ten days, considerable work and bookkeeping is involved if checks have to be made out for practically every invoice.

If the matter is taken up in the right spirit with the sellers, arrangements can frequently be made to send checks twice a month on the basis that all invoices dated from the first to the fifteenth shall be paid on the twenty-fifth of the same month, and all invoices dated from the sixteenth to the last day of the month, on the tenth proximo. This arrangement gives ample time to get them approved, and effects a considerable saving in bookkeeping work.

Avoiding Duplicate Payment of Invoices.—It may seem inconceivable to those persons unaccustomed to handling invoices that any establishment with an efficient accounting system could pay an invoice twice. Yet this has occurred in many business concerns, both large and small. Moreover the difficulty will probably never be entirely overcome while the human element is a factor in invoice transactions.

There are, however, many safeguards which can be erected by the purchasing department to prevent duplication of payments. One of the best methods, and perhaps the one most effective and most generally adopted, is to enter each invoice on the copy of the order retained in the purchasing agent's office. Any duplicate coming through should then be instantly detected and destroyed if the original is found to be in

existence. If the original cannot be found, then to provide against any contingency of its turning up, the duplicate can be approved. It should be distinctly and prominently marked as a duplicate, so that the attention of the accounting department cannot fail to be attracted to its status.

In some concerns many thousands of invoices pass through the purchasing department every month, and each one of these represents something definite to that department, and has a tangible connection with some contract or order. But when these invoices arrive in the accounting department, they are simply so many documents to be collected, tabulated, allocated, and vouchered, if they carry the proper authentication and approval. It is the purchasing department which must absolutely see to it that no improper invoice gets through.

If it were just a question of duplicate invoices—that is, invoices of the same date, for the same amount, and for the same material—the matter would be simplified, because these are more easily detected. But there are complications. For example, two invoices may be rendered for the same material but, through some mistake, bear different dates. Also an order may be placed for 250 articles, with instructions to ship 50 by express and 200 by freight. The express shipment is forwarded and an invoice mailed for 50. Probably the following day, or shortly afterward, the remaining 200 are shipped by freight. This time, another invoice is rendered for the full quantity of 250. There are many other ways in which invoices can be made out improperly but inadvertently by the

sellers, but these illustrations will suffice to show that it is entirely the province of the purchasing department to prevent approval of them. If they once get through that department they will probably be paid.

There are other methods of preventing duplicate payments. I shall describe one here. The receiving clerk's receipt form can be attached to every invoice, and if a duplicate bill, or one for an excessive amount of material, is rendered there will be no receiving slip attached by which payment could be authorized. I shall give the details of these preventive measures in the chapter on "Routine Work."

Credits.—Incorrect invoices will appear in every purchasing department; the manner of handling them varies considerably. Any simple scheme that is effective is all that is necessary. If there is too much red tape, it will destroy the usefulness of the plan; the task is merely to rectify and adjust the discrepancies. In considering this problem, it is important to ascertain in what manner these discrepancies arise. There are various ways in which invoices may be inaccurate. The price may be incorrect, or the extensions or footings may be wrong. Quantities in excess of order may be shipped or billed, or the material may not pass the specified tests for quality. Invoices that fall into these classes accumulate with amazing rapidity in large offices, and some effective method must be devised for disposing of them.

Some concerns hold all such bills until a credit or a corrected invoice is received. This course is open to many objections. Sellers are generally very slow in investigating such matters, and the buyer may

write half a dozen letters before getting any satisfaction. Accordingly, so much time may elapse that it will be difficult for either side to produce tangible proofs to support or controvert the claim, as the case may be. Such delay causes further complications in connection with cash discounts, for the buyer often claims that he is entitled to the discount whenever the bill is paid, if the mistake in it is the fault of the seller. The seller, on his part, is unwilling to allow this contention. Evidently, it is imperative to dispose of all inaccurate invoices in the shortest possible time, not only to expedite the work in the buyer's accounting department, but in order to prevent the necessity of the large amount of work which will arise in connection with them if they are held indefinitely.

The scheme which has been found most satisfactory, and which I would here suggest, is the one according to which the buyer makes out debits against the seller. The forms to be used will be found in the chapter on "Routine Work." Even when this plan is used, some invoices must be held for adjustment, because some discrepancies are always open to argument, and the purchasing department must be absolutely and positively certain, in making a debit, that it is justified. If it is not, then the debit will not be accepted by the seller, and the whole matter will be hung up again. When a doubt exists, caution must be exercised—the seller should be given an opportunity to explain his view of the matter. The whole subject of deductions from invoices and allowances upon them, is a source of much trouble and annoyance, but the problem can be greatly simplified if

judgment, discretion, and dispatch are all employed.

Meaning of "Net Cash."—The term "net cash" is a somewhat ambiguous expression because no interpretation that has universal acceptance can be placed on it. A majority of the invoices received in a purchasing department are issued in accordance with terms specifically agreed upon and stated on the order, but there are a great many that are received for goods ordered verbally without a definite understanding as to terms. Frequently these are marked "Net Cash."

This expression is interpreted by some to mean that payment is to be made in thirty days, and by others that payment should be made on delivery. Again, some distinguish between "Spot Cash" and "Net Cash;" they take the former to mean that payment must be made as soon as an invoice is received, and the latter to imply that payment must be made as soon as delivery is effected and the recipient has had time to check and examine the goods and invoice.

What does the firm mean that is responsible for putting this term on a billhead? Can it be shown that sellers attach any significance to the literal term "Net Cash"? My own experience leads me to believe that it should be interpreted as meaning that no cash discount will be allowed under any circumstances, and that the invoice must be paid at the expiration of the usual net time allowed by the established custom of the trade for the particular article, material, or commodity represented by the invoice.

Freight Charges.—Transportation problems were referred to in the last chapter, but the question of

checking and approving freight charges remains still to be considered. If a traffic department is maintained by the establishment, then it is the duty of that department to check and approve all transportation charges. If this is not done by the traffic department, the purchasing department must do the work.

Some member of the purchasing department should have sufficient experience in traffic problems to handle these matters intelligently. If there is sufficient volume of work, it may take all the time of one man, or even of several men. In any case, there should be a special routine for taking care of it. I shall outline this procedure in a simple manner in the discussion of routine work. If the amount of work justifies a complicated or extensive system, it would be handled by a department organized especially to do it.

There is considerable difference of opinion concerning the relation of freight charges to cash discounts. It is contended by many buyers that when an order has been placed "f. o. b. point of shipment," with freight allowed to destination, the cash discount should be deducted first and the freight afterwards. Others, however, are of the opinion that the freight should be deducted first, and the cash discount should be taken on the net amount only. This is a debatable point, and no legal decision seems ever to have been given on it. When the freight charge is small, the question is not of great moment. But there are many cases in which the freight item is large; the point then at once becomes more important.

When material is purchased "f. o. b. destination," the buyer does not deduct an amount equivalent to

the freight charges before deducting the cash discount, since he is not interested in the transportation cost. The seller agrees actually to deliver the goods to the buyer, and must pay freight charges and assume risks of ownership until they are delivered.

It is my opinion that when goods are bought "f. o. b. point of shipment," with a partial freight allowance or full freight allowance to destination, in making settlement the freight should be deducted first, and the cash discount subsequently. The reason is that the freight allowance is in the same category as any other allowance, deduction, or even trade discount. All of these would be first deducted, and the net amount of invoice would then be subject to the agreed cash discount.

Invoices Without Previous Price Arrangement.—

There are always some orders placed on which no price is mentioned. The invoices received against these orders need careful scrutiny; the responsibility for securing a fair price devolves upon the person doing the work. It is therefore necessary for him to have a complete price index. A form for this purpose is shown in Figure 22. It may be possible, in allocating and arranging the work of the department, to have one comprehensive and complete price record to which reference can be made by all interested employees. Figure 14, in Chapter IV, illustrates one method of recording prices. This is intended more particularly for the use of the price clerk; in those instances in which it is essential to keep quotations and general prices distinct from invoice prices, separate records must be kept.

and kept up to date. All trade discounts and customs must be noted, and a record must be made of all changes in trade discounts and methods of figuring. It is becoming more common to quote base prices for many materials, with extras for various sizes, weights, or quantities, and additional extras for quality, style, or finish. It is no small accomplishment to become thoroughly familiar with, and well-versed in, all of these items. While some of them are simple, others are quite complicated. The task is perhaps simple enough for the sellers, since they have only to become acquainted with their own particular price list, but the purchasing department that buys many hundreds, and perhaps thousands, of articles must keep a record easy of reference and simple in exposition. Figures 23 to 26 illustrate a method that may be employed for this purpose.

The Buyer's Obligation.—Generally speaking, it seems to be "human nature" for a person to make more strenuous efforts to get obligations due him satisfactorily settled, than to settle his own obligations. There is nothing that will injure purchasing more than the neglect of invoices or the careless and ill-considered treatment of them. If petty and trifling matters are made to look momentous and important; if attempts are made to enforce unfair claims; if unjust deductions are made; if cash discounts are abused; or if payment is delayed for some trivial reason—the buyer will sooner or later feel the effects of such a policy.

Loss of prestige is one of the greatest deterrents to good purchasing, and a buyer will certainly lose

DATE	DISCOUNT	TURNED, GROUND, HIGHLY-POLISHED STEEL SHAFTING STOCK SIZES				FREIGHT ALLOWANCES AND DELIVERY	
		Diam.	Weight per ft.	Price per lb.	Weight per ft.	Price per lb.	The discount or price quoted is base, Pittsburgh. If shipment is made from a point other than Pittsburgh (or Pittsburgh district) the freight from Pittsburgh to destination will be added, and the freight from shipping point to destination deducted. No allowance of freight adjustment on 300 lbs. or less.
		1 1/8	3.77	5 1/2 cts	3 3/4	37.56	QUANTITY DIFFERENTIALS All specifications for less than 1000 pounds of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of the exact quantity actually shipped: 500 to 999 pounds.....\$0.03 per 100 pounds net 100 to 499 pounds....." .10 " 100 " " Less than 100 pounds....." .20 " 100 " " SHAFTING—EXTRAS ON ROUNDS, SIZES SMALLER THAN 1 1/8" Lie prices on sizes smaller than 1 1/8" apply on screw stock quality in random mill lengths only. Shifting quality or screw stock cut to accurate lengths—Ls. per 100 pounds net extra, in addition to usual extras for accuracy, short and long lengths and special carbon.
		1 1/4	4.17		3 3/8	40.10	
		1 1/2	4.60		4	41.40	
		1 3/4	5.05		4 1/4	42.73	
		1 7/8	5.52		4 1/2	46.83	EXTRAS FOR CHAMFERING (For Automatic Screw Machine Use Only) Round and Square Per 100 Pounds Net Per 100 Pounds Net 1/2" to 1".....\$0.13 1" to 2"....." .13 2" and larger....." .04 These extras apply on lengths 10 ft. and longer and one end bar only. For sizes smaller than 1 1/2" and shorter than 10 ft., special prices will be quoted.
		2	6.01		4 3/4	48.24	
		2 1/8	6.52		4 3/8	51.11	
		2 1/4	7.05		4 3/4	52.58	
		2 3/8	7.61	5 1/2 cts	4 1/2	54.07	BOXING AND BURLAPPING Boxing (minimum 50c).....\$0.20 per 100 pounds Burlapping (minimum 25c), full length....." .15 " 100 " Burlapping of ends only....." .05 " 100 " We recommend that all less than cut-off shipments be boxed. If the buyer is unwilling to bear the expense of boxing, we will not be responsible for safe delivery, nor will we entertain claims for bent or damaged bars. Customer should state with order if wanted boxed or unboxed.
		2 1/2	8.18		4 1/4	58.67	
		2 3/4	8.78		4 1/2	60.25	
		2 7/8	9.39		4 3/4	63.10	
		3	10.02		5	66.76	Application of Prices on Prices on
		2 1/8	10.68		5 1/8	71.86	
		2 1/4	11.36		5 1/4	73.60	
		2 1/2	12.07		5 1/2	78.95	
		2 3/4	12.78		5 3/4	80.77	7 1/2 cts 8 1/2 cts 9 cts
		2 7/8	13.52		5 3/8	86.38	
		3	14.28		5 1/2	88.29	
		3 1/8	15.07		5 1/4	94.14	
		3 1/4	15.87	5 cts	6	96.14	7 1/2 cts 8 1/2 cts 9 cts
		3 1/2	16.69		6 1/8	102.2	
		3 3/4	17.55		6 1/4	104.3	
		3 7/8	18.41		6 1/2	110.7	
		4	19.29		6 3/4	112.8	7 1/2 cts 8 1/2 cts 9 cts
		4 1/8	20.20		6 3/8	119.4	
		4 1/4	21.15		6 1/2	121.7	
		4 1/2	22.07		6 3/4	128.5	
		4 3/4	23.04		7	130.9	7 1/2 cts 8 1/2 cts 9 cts
		4 1/2	24.03		7 1/8	137.9	
		4 3/4	26.09		7 1/4	140.4	
		4 3/8	27.13		7 1/2	147.7	
		4 3/4	28.21	5 1/2 cts	7 3/4	150.2	7 1/2 cts 8 1/2 cts 9 cts
		4 3/4	30.43		7 1/2	157.8	
		4 3/4	31.56		7 1/4	160.3	
		4 3/4	32.71		7 3/4	168.2	
		4 3/4	35.09	5 1/2 cts	8	171.	7 1/2 cts 8 1/2 cts 9 cts
		4 3/4	36.31		8		
		4 3/4					
		4 3/4					

FIG. 28. If price lists are collected, and entered on loose leaf sheets, a quick and easy means is at hand for checking prices.

	Date	Base Price	<div> <p>Extras on Standard Wire Nails in Kegs Originally adopted and effective December 1.</p> </div> <div> <p>COMMON WIRE NAILS TO MATCH COMMON HEADS</p> <p>ADVANCES</p> <p>10d to 60d. Base 4d and 6d \$0.30 10d to 16d \$0.05 2d .45 2d and 4d .10 3d .70 4d and 6d .30 5d .40 6d and 7d .30 3/4d .40</p> <p>BARBED COMMON AND BARBED C&E NAILS 15 cents advance over common.</p> <p>SMOOTH RIDING AND SMOOTH BOX NAILS 10d and larger. .90 15 2d and 4d .35 6d and 7d .35 4d and 6d .70 2d .100 3d .100</p> <p>Barbed Box, 15 cents advance over smooth nail.</p> <p>SMOOTH FINISHING NAILS 10d and larger. .90 15 2d and 4d .35 6d and 7d .35 4d and 6d .70 2d .100 3d .100</p> </div> <div> <p>SLATING NAILS</p> <p>2d. .00 25 3d. .15 4d. .60 6d. .40 8d. .40 10d to 60d. .30</p> <p>FIN NAILS</p> <p>2d extra fine 1 1/2 inch. \$1.10 2d fine. 1.00 3d 1 1/2 inch. .45 3d extra fine 1 1/2 inch. .45 4d. .40</p> <p>BARREL NAILS</p> <p>3 1/2 inch. \$0.50 4 inch. 1.00 1 1/2 inch. .60 4 1/2 inch. .25 1 1/2 inch. .40 1 1/2 inch. .70 1 1/2 inch. .30</p> <p>BARRED ROOFING NAILS</p> <p>3 1/2 inch. \$0.75 4 inch. .45 4 1/2 inch. .45 1 1/2 inch. .40 1 1/2 inch. .45 1 1/2 inch. .45</p> </div> <div> <p>CLINCH NAILS (Annealed or Bright)</p> <p>2d. .00 25 3d. .15 4d and 6d .40 6d and 7d .45 8d .45 10d to 60d. .35</p> <p>HINGE NAILS (Annealed or Bright)</p> <p>4d. .90 50 6d. .70 8d. .60 10d and larger. .50</p> <p>ROAT NAILS 25 cents extra over hinge.</p> <p>SPIKES All sizes to 9-inch. .90 15 10-inch and larger. .15 Special Gages 10c additional.</p> <p>BARRED DOWEL PINS</p> <p>3 1/2 inch. \$1.15 1 1/2 inch. \$0.40 4 inch. .35 1 1/2 inch. .40 4 1/2 inch. .35 1 1/2 inch. .40 1 1/2 inch. .35 1 1/2 inch. .40</p> </div> <div> <p>SPECIAL EXTRAS ON STANDARD WIRE NAILS</p> <p>Annealed Nails, 15c per 100 lbs. Special Finish, 15c per 100 lbs. Special Bright, 15c per 100 lbs. Galvanizing All Standard Nails, 3c Special Price.</p> </div>
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FIG. 24. This shows the extras on nails. A record, at the side, gives a history of the advance or decline for any period.

Base Prices	Dates Established	Present Discount	Date Established	RUBBER COVERED WIRE, N. E. C. STD. PRICE LIST 38 Cent Base									
				B. & S. GAUGE PRICES PER 1000 FEET 0-600 VOLTS									
				SOLID		STRANDED		FLEXIBLE					
Size	Single	Double	Braid	Double	Braid	Single	Double	Single	Double	Single	Double	Single	Double
0000													
000													
00													
0													
1													
2													
3													
4													
5													
6													
8													
9													
10													
12													
14													
DUPEX													
Size	Solid	Stranded	Size	Solid	Stranded	Size	Solid	Stranded	Size	Solid	Stranded	Size	Stranded
8													
10													
12													
14													
CIRCULAR MIL CABLE													
Size	Stranded	Flexible	Size	Stranded	Flexible	Size	Stranded	Flexible	Size	Stranded	Flexible	Size	Stranded
2,000,000 C. M.													
1,750,000 C. M.													
1,500,000 C. M.													
1,250,000 C. M.													
1,000,000 C. M.													
950,000 C. M.													
900,000 C. M.													
850,000 C. M.													
800,000 C. M.													
750,000 C. M.													

FIG. 25. The price of insulated wire changes with the base price of copper; this record is very valuable.

CONTRACT DISCOUNT	DISCOUNTS		DATE		
	Iron	Steel			
From _____ To _____					

STANDARD HOISTING ROPE. Composed of 6 Strands and a Hemp Center, 19 Wires to the Strand. IRON.									
Trade Number.	Last price per foot.	Diameter in inches.	A.P. circum. in inches.	A.P. weight per foot.	A.P. strength in tons of 2000 lbs.	Proper work- ing load in tons of 2000 lbs.	Diameter of strand or sheave in feet.		
10	\$1.40	1/16	3/16	1.35	11	22.3	17		
10 1/2	1.44	1/8	3/8	1.36	11	22.3	17		
11	1.47	1/8	3/8	1.36	11	22.3	17		
11 1/2	1.50	1/8	3/8	1.36	11	22.3	17		
12	1.53	1/8	3/8	1.36	11	22.3	17		
12 1/2	1.56	1/8	3/8	1.36	11	22.3	17		
13	1.59	1/8	3/8	1.36	11	22.3	17		
13 1/2	1.62	1/8	3/8	1.36	11	22.3	17		
14	1.65	1/8	3/8	1.36	11	22.3	17		
14 1/2	1.68	1/8	3/8	1.36	11	22.3	17		
15	1.71	1/8	3/8	1.36	11	22.3	17		
15 1/2	1.74	1/8	3/8	1.36	11	22.3	17		
16	1.77	1/8	3/8	1.36	11	22.3	17		
16 1/2	1.80	1/8	3/8	1.36	11	22.3	17		
17	1.83	1/8	3/8	1.36	11	22.3	17		
17 1/2	1.86	1/8	3/8	1.36	11	22.3	17		
18	1.89	1/8	3/8	1.36	11	22.3	17		
18 1/2	1.92	1/8	3/8	1.36	11	22.3	17		
19	1.95	1/8	3/8	1.36	11	22.3	17		
19 1/2	1.98	1/8	3/8	1.36	11	22.3	17		
20	2.01	1/8	3/8	1.36	11	22.3	17		
20 1/2	2.04	1/8	3/8	1.36	11	22.3	17		
21	2.07	1/8	3/8	1.36	11	22.3	17		
21 1/2	2.10	1/8	3/8	1.36	11	22.3	17		
22	2.13	1/8	3/8	1.36	11	22.3	17		
22 1/2	2.16	1/8	3/8	1.36	11	22.3	17		
23	2.19	1/8	3/8	1.36	11	22.3	17		
23 1/2	2.22	1/8	3/8	1.36	11	22.3	17		
24	2.25	1/8	3/8	1.36	11	22.3	17		
24 1/2	2.28	1/8	3/8	1.36	11	22.3	17		
25	2.31	1/8	3/8	1.36	11	22.3	17		
25 1/2	2.34	1/8	3/8	1.36	11	22.3	17		
26	2.37	1/8	3/8	1.36	11	22.3	17		
26 1/2	2.40	1/8	3/8	1.36	11	22.3	17		
27	2.43	1/8	3/8	1.36	11	22.3	17		
27 1/2	2.46	1/8	3/8	1.36	11	22.3	17		
28	2.49	1/8	3/8	1.36	11	22.3	17		
28 1/2	2.52	1/8	3/8	1.36	11	22.3	17		
29	2.55	1/8	3/8	1.36	11	22.3	17		
29 1/2	2.58	1/8	3/8	1.36	11	22.3	17		
30	2.61	1/8	3/8	1.36	11	22.3	17		
30 1/2	2.64	1/8	3/8	1.36	11	22.3	17		
31	2.67	1/8	3/8	1.36	11	22.3	17		
31 1/2	2.70	1/8	3/8	1.36	11	22.3	17		
32	2.73	1/8	3/8	1.36	11	22.3	17		
32 1/2	2.76	1/8	3/8	1.36	11	22.3	17		
33	2.79	1/8	3/8	1.36	11	22.3	17		
33 1/2	2.82	1/8	3/8	1.36	11	22.3	17		
34	2.85	1/8	3/8	1.36	11	22.3	17		
34 1/2	2.88	1/8	3/8	1.36	11	22.3	17		
35	2.91	1/8	3/8	1.36	11	22.3	17		
35 1/2	2.94	1/8	3/8	1.36	11	22.3	17		
36	2.97	1/8	3/8	1.36	11	22.3	17		
36 1/2	3.00	1/8	3/8	1.36	11	22.3	17		
37	3.03	1/8	3/8	1.36	11	22.3	17		
37 1/2	3.06	1/8	3/8	1.36	11	22.3	17		
38	3.09	1/8	3/8	1.36	11	22.3	17		
38 1/2	3.12	1/8	3/8	1.36	11	22.3	17		
39	3.15	1/8	3/8	1.36	11	22.3	17		
39 1/2	3.18	1/8	3/8	1.36	11	22.3	17		
40	3.21	1/8	3/8	1.36	11	22.3	17		
40 1/2	3.24	1/8	3/8	1.36	11	22.3	17		
41	3.27	1/8	3/8	1.36	11	22.3	17		
41 1/2	3.30	1/8	3/8	1.36	11	22.3	17		
42	3.33	1/8	3/8	1.36	11	22.3	17		
42 1/2	3.36	1/8	3/8	1.36	11	22.3	17		
43	3.39	1/8	3/8	1.36	11	22.3	17		
43 1/2	3.42	1/8	3/8	1.36	11	22.3	17		
44	3.45	1/8	3/8	1.36	11	22.3	17		
44 1/2	3.48	1/8	3/8	1.36	11	22.3	17		
45	3.51	1/8	3/8	1.36	11	22.3	17		
45 1/2	3.54	1/8	3/8	1.36	11	22.3	17		
46	3.57	1/8	3/8	1.36	11	22.3	17		
46 1/2	3.60	1/8	3/8	1.36	11	22.3	17		
47	3.63	1/8	3/8	1.36	11	22.3	17		
47 1/2	3.66	1/8	3/8	1.36	11	22.3	17		
48	3.69	1/8	3/8	1.36	11	22.3	17		
48 1/2	3.72	1/8	3/8	1.36	11	22.3	17		
49	3.75	1/8	3/8	1.36	11	22.3	17		
49 1/2	3.78	1/8	3/8	1.36	11	22.3	17		
50	3.81	1/8	3/8	1.36	11	22.3	17		
50 1/2	3.84	1/8	3/8	1.36	11	22.3	17		
51	3.87	1/8	3/8	1.36	11	22.3	17		
51 1/2	3.90	1/8	3/8	1.36	11	22.3	17		
52	3.93	1/8	3/8	1.36	11	22.3	17		
52 1/2	3.96	1/8	3/8	1.36	11	22.3	17		
53	3.99	1/8	3/8	1.36	11	22.3	17		
53 1/2	4.02	1/8	3/8	1.36	11	22.3	17		
54	4.05	1/8	3/8	1.36	11	22.3	17		
54 1/2	4.08	1/8	3/8	1.36	11	22.3	17		
55	4.11	1/8	3/8	1.36	11	22.3	17		
55 1/2	4.14	1/8	3/8	1.36	11	22.3	17		
56	4.17	1/8	3/8	1.36	11	22.3	17		
56 1/2	4.20	1/8	3/8	1.36	11	22.3	17		
57	4.23	1/8	3/8	1.36	11	22.3	17		
57 1/2	4.26	1/8	3/8	1.36	11	22.3	17		
58	4.29	1/8	3/8	1.36	11	22.3	17		
58 1/2	4.32	1/8	3/8	1.36	11	22.3	17		
59	4.35	1/8	3/8	1.36	11	22.3	17		
59 1/2	4.38	1/8	3/8	1.36	11	22.3	17		
60	4.41	1/8	3/8	1.36	11	22.3	17		
60 1/2	4.44	1/8	3/8	1.36	11	22.3	17		
61	4.47	1/8	3/8	1.36	11	22.3	17		
61 1/2	4.50	1/8	3/8	1.36	11	22.3	17		
62	4.53	1/8	3/8	1.36	11	22.3	17		
62 1/2	4.56	1/8	3/8	1.36	11	22.3	17		
63	4.59	1/8	3/8	1.36	11	22.3	17		
63 1/2	4.62	1/8	3/8	1.36	11	22.3	17		
64	4.65	1/8	3/8	1.36	11	22.3	17		
64 1/2	4.68	1/8	3/8	1.36	11	22.3	17		
65	4.71	1/8	3/8	1.36	11	22.3	17		
65 1/2	4.74	1/8	3/8	1.36	11	22.3	17		
66	4.77	1/8	3/8	1.36	11	22.3	17		
66 1/2	4.80	1/8	3/8	1.36	11	22.3	17		
67	4.83	1/8	3/8	1.36	11	22.3	17		
67 1/2	4.86	1/8	3/8	1.36	11	22.3	17		
68	4.89	1/8	3/8	1.36	11	22.3	17		
68 1/2	4.92	1/8	3/8	1.36	11	22.3	17		
69	4.95	1/8	3/8	1.36	11	22.3	17		
69 1/2	4.98	1/8	3/8	1.36	11	22.3	17		
70	5.01	1/8	3/8	1.36	11	22.3	17		
70 1/2	5.04	1/8	3/8	1.36	11	22.3	17		
71	5.07	1/8	3/8	1.36	11	22.3	17		
71 1/2	5.10	1/8	3/8	1.36	11	22.3	17		
72	5.13	1/8	3/8	1.36	11	22.3	17		
72 1/2	5.16	1/8	3/8	1.36	11	22.3	17		
73	5.19	1/8	3/8	1.36	11	22.3	17		
73 1/2	5.22	1/8	3/8	1.36	11	22.3	17		
74	5.25	1/8	3/8	1.36	11	22.3	17		
74 1/2	5.28	1/8	3/8	1.36	11	22.3	17		
75	5.31	1/8	3/8	1.36	11	22.3	17		
75 1/2	5.34	1/8	3/8	1.36	11	22.3	17		
76	5.37	1/8	3/8	1.36	11	22.3	17		
76 1/2	5.40	1/8	3/8	1.36	11	22.3	17		
77	5.43	1/8	3/8	1.36	11	22.3	17		
77 1/2	5.46	1/8	3/8	1.36	11	22.3	17		
78	5.49	1/8	3/8	1.36	11	22.3	17		
78 1/2	5.52	1/8	3/8	1.36	11	22.3	17		
79	5.55	1/8	3/8	1.36	11	22.3	17		
79 1/2	5.58	1/8	3/8	1.36	11	22.3	17		
80	5.61	1/8	3/8	1.36	11	22.3	17		
80 1/2	5.64	1/8	3/8	1.36	11	22.3	17		
81	5.67	1/8	3/8	1.36	11	22.3	17		
81 1/2	5.70	1/8	3/8	1.36	11	22.3	17		
82	5.73	1/8	3/8	1.36	11	22.3	17		
82 1/2	5.76	1/8	3/8	1.36	11	22.3	17		
83	5.79	1/8	3/8	1.36	11	22.3	17		
83 1/2	5.82	1/8	3/8	1.36	11	22.3	17		
84	5.85	1/8	3/8	1.36	11	22.3	17		
84 1/2	5.88	1/8	3/8	1.36	11	22.3	17		
85	5.91	1/8	3/8						

prestige if he adopts any of the methods just mentioned. It is in connection with invoices that the buyer's principal obligations exist. He should therefore use all diligence to get his invoices approved promptly. When differences of opinion do arise, he should handle them in a broad-minded, capable manner and, while insisting on a just and proper settlement, he should conduct negotiations without friction or bad feeling. This policy will have a most beneficial effect, and even if it is necessary for the buyer at some time to make some slight concession he will probably gain far more than he loses, when making additional purchases.

Invoices and Cash Discounts.—An understanding must be arrived at with the financial department in regard to the time required for it to do its part in paying an invoice, and it is then up to the purchasing department to get the invoices through to the financial department in ample time. When this has been accomplished, the purchasing department has done its part in fulfilling its obligation.

The trouble over cash discounts and the abuse of them, is rarely the fault of the purchasing department. The understanding with the seller is usually quite clear, and claims are very seldom raised in connection with cash discounts by the purchasing department. The financial department is more frequently at fault in this respect. In some cases it may be lack of adequate finances which causes that department to withhold payment for a few days; but more often it is because the financial organization does not fully recognize the importance of living up to contract

terms. The agreement as to the discount is part of the original contract, and no purchasing agent worthy of the name would for one moment think of attempting to evade contract obligations—for this is what the abuse of cash discounts means.

Other departments, however, not so directly and intimately in contact with sellers look on these obligations with some laxity. The production department will sometimes want to postpone or change delivery dates, and regard such procedure very lightly, whereas it really may involve serious consequences for the seller. Likewise the financial department may look with indifference on a delay of a few days in making a payment. It is the purchasing department which has to stand between these departments and the seller and bear the brunt of any blame which may result. Such incidents are not conducive to good buying, in view of their effect on the standing which the purchasing agent holds with the sellers.

It may be asked why the sellers themselves submit to the abuse of cash discounts. Some of them do not; they will promptly return any checks that do not arrive on time. Nevertheless, it is safe to say that the majority of them do acquiesce in these transgressions—some because they need the money, and others because they think a refusal would imperil their relations with the buyer.

Sometimes a buyer will make the excuse that the goods did not reach him within ten days, and that he is therefore entitled to examine them before paying. The buyer knows that delivery dates are uncertain when the time required for transportation cannot

always be definitely gauged. He knows this when he makes the contract, and he also knows that it may mean paying the invoice before the goods are received. If such an arrangement is not satisfactory to him, then he should not make a contract on this basis. He should certainly not do so if he doubts the probity of the seller to such an extent that he feels he could not get a proper adjustment on a subsequent payment if there should be any discrepancies.

Each party should observe the provisions of the contract; otherwise confidence is impaired and suspicion is generated. The purchasing agent who experiences serious and unaccountable delays in the receipt of goods may oftentimes trace the trouble to slackness in financial settlements, resulting in preferences being given to the concerns that pay most promptly.

It is an undoubted fact that the cash discount privilege is gradually being curtailed, but its complete abolishment is still a long way off. Probably among the causes for this curtailment the most prominent is the abuse of the privilege by the buyer and the resultant controversies with the seller, with the result that the latter is left with a large number of unbalanced accounts.

CHAPTER VIII

THE PURCHASING AGENT

Responsibility.—One man is not always wholly responsible for the determination of all the factors connected with purchasing for an industrial establishment. Questions regarding quality and quantity may be determined by the engineer or by the man in charge of production, but the responsibility does rest much more on one man than on another. The developments in the art of purchasing have increased its importance and influence as a business function, and have brought more into prominence the men in charge of the work. They now hold a position of distinction and consequence in commercial undertakings.

There are several titles in use for the men in charge of purchasing. Manager of Purchases, Director of Purchases, and other forms are used to designate the head of the department, but the title most generally adopted is Purchasing Agent. In connection with this man's work the following is quoted from an address delivered by W. G. Besler, President of the Central Railroad of New Jersey, at a meeting of the National Association of Purchasing Agents.

Have we taken sufficient account of the potentialities of the purchasing agent? Has he been sufficiently recognized as a factor in our daily conferences, and do we appreciate him at

his full worth and give him a standing commensurate with that to which he is entitled? I am afraid that some do not place a sufficiently high standard upon the position of the purchasing agent. At least, I have found instances which justify the thought that he is considered a sort of necessary nuisance who will attend to the filling of requisitions and the purchasing of material which other departments direct; and he has been regarded more in the light of an amplified clerk than an officer of the company, with executive ability and a keen insight into the affairs of the concern. A man who is big enough to be entrusted with the expenditure of vast sums amounting to hundreds of thousands of dollars, is also big enough to be taken into the councils of the executives.

Qualifications.—Great progress has been made in purchasing during recent years. In view of this fact, it is unfortunate that while the character and type of some purchasing agents have necessarily made their positions ones of recognized importance and authority, there have been too many who were simply “order-placers.” These conditions are fast changing, however, and to-day there is no reason why a man should be holding the title of purchasing agent whose duties merely consist in keeping records of purchases, orders issued, goods received, and invoices checked. In industrial organizations there is ample scope, beyond the mere clerical features connected with the work, for the activities of the man in charge of purchasing. To develop the purchasing function and maintain it at its highest plane of usefulness, it is necessary to have a man with certain qualifications.

This man, first of all, should have good judgment, and should be well-balanced, shrewd, sagacious, and well-fortified with the particular knowledge essential in his work. He should also have an appreciation of

values. This does not mean simply a knowledge of prices—a knowledge of values is of far more consequence and importance, and implies a vast fund of information for their accurate determination. He must have a broad viewpoint. He should always possess executive ability; modern purchasing requires a purchasing agent who can deal with the executives of an organization more or less on their own level. He should be able to make others recognize the true importance of his position, and he should be capable of carrying on his work in its relation to the various functions of the industrial organization.

The purchasing agent should by all means be analytical. The analysis of values is a primary factor in good purchasing. He should have the ability and the knack of analyzing information regarding values until he has brought to light every pertinent fact and exhausted every possible means of securing further knowledge from the available records. This requirement is probably the main reason why we hear so much today of purchasing engineers—not because of their engineering education particularly, but because they have been trained, as a rule, to analyze to the minutest details.

Coupled with the power of analysis the purchasing agent should have a talent for comparison, because through comparison he obtains to a large extent his true estimate of values.

He should be aggressive, because it is often necessary for him to impress his views not only on all the units of the organization, but on sellers as well. He should be progressive, and should have considerable

initiative and originality, inasmuch as a great many of the facts he presents should come from him unsolicited.

He should be resourceful, for he may often be required to prove certain data and facts different from, or in addition to, his regularly recorded information, and unless he is awake to every opportunity he may not know from what sources to secure it, or, knowing these, may not know how to procure it.

He should have imagination, in order that he may visualize and intelligently understand the conditions which are portrayed and represented by the avenues of information on business conditions which are available for everyday reference.

Breadth and Vision.—It must be admitted that many purchasing agents in industrial establishments have not the status which the importance of their work warrants. The explanation is that those purchasing agents who have not received this full recognition are lacking in breadth and vision. Large questions come for them to answer, yet they cannot see beyond their daily routine work.

This lack of breadth means that when some really important matter comes up such a purchasing agent has to report to some executive, who may take the matter out of his hands. The purchasing agent needs a viewpoint, an outlook, which shall embrace the whole organization, its mission, and its destiny. If he has this, he will not become narrow—and narrowness is probably the prevailing fault of present-day purchasing agents. It is perhaps unfair, however, to single out purchasing agents and stigmatize them

with this fault, because it is common to many other men who specialize in a single business function.

Like all specialists, the purchasing agent is apt to confine himself too closely to his own particular work. He will follow prices closely, keep in touch with supply sources, get deliveries promptly, and constantly strive to perfect himself in all those things which make for skillful buying and the reputation of his department. But in doing this he may overlook the broad policy of the establishment, with which his work should be in accord. He is apt to sacrifice quality for price; he may overlook the importance of having every department working in harmony with the others; he may not see the value of price in its true proportion.

Why do salesmen often try to get a hearing with an executive, "over the head" of the purchasing agent, especially if they have goods of merit to offer? They realize that they will receive broader treatment, that the executive will give due consideration to all sides of the question, and will view price, quantity, delivery, service, and so on, in their true perspective. But a salesman will never go beyond the purchasing agent's office if he meets there the man who can weigh all these points judicially and fairly, and give good judgment on the facts presented and on the knowledge he has of the general policy, aims, and ambitions of the concern.

Vendors and their salesmen and representatives are quite often quicker to sense the general policy of the houses to which they sell than the men actually doing the buying; or, if this is not the case, they sometimes

have a viewpoint which covers a larger range of vision than that of the buyer. It is essential, therefore, that they be given a hearing, and that their statements be weighed and calibrated. Granted that many times suggestions and propositions which they make are not worthy of consideration, nevertheless in the long run, taking the good with the bad, the purchasing agent is the gainer.

Finance and the Buyer.—The average business man is apt to spurn information on things financial as impractical theory, but a purchasing agent should be financially weather-wise. For the successful buyer no information is too slight to be disregarded, and information regarding financial affairs is particularly applicable to purchasing.

Many materials are stable in price, irrespective of financial conditions. But there are also many for which there is a sensitively fluctuating market, and these will be distinctly affected by changing financial conditions. There is certain information from which can be deduced a principle for general application for such material.

If a purchasing agent knows during what periods of the year there is a large demand for money, and during what periods the demand is slight, he has partially solved the question as to what time of year, under normal conditions, it is wise to buy or sell.

The causes affecting the level of prices of sensitively fluctuating materials are not simple. Some of these causes—of which one is the supply of money—recur regularly, though the intensity of their effect is variable. The forehanded buyer will seek to recog-

nize these causes, to judge their intensity, and finally to learn to modify his conclusions concerning their abnormal occurrences in times of great business activity, as during wars or when there are rumors of war.

Management and Administration.—The purchasing agent should understand both of these terms, because he must both manage the purchasing and his department, and administer the policies of the organization, in so far as they affect his work and also the minor policies of his department. Management is a thinking job and lays down general policies, while administration accepts these policies as orders and translates them into specific action.

The organization and management of a purchasing department call for very much the same qualities as the organization and management of a business. Many business men seek success in management through methods and systems, or by means of what is called efficiency, or scientific management. These compel the mind to revert to some perfectly modeled plans or processes which are supposed to straighten out, as by magic, all kinks, worries and troubles.

Thinking business men know better, and have long since abandoned the hope that mere methods and systems will of themselves accomplish anything, but they do know that scientific organization, intelligent analysis, and constructive thought will lead to greatly improved conditions if accompanied by something more than mere mechanical processes and changes. In other words, there must be vision and purpose, high ideals, loyalty, and service.

The purchasing agent must be the guide and inspiration of his department and must assist in the formulation of the purchasing policies. If he is a man of vision, a man who is broad enough to forecast and visualize possibilities; if the commanding figure is thoroughly imbued with ideals of business of the highest type; and if he makes purposeful efforts to put them into effect—then a purpose of similar character will permeate his assistants, and the smaller matters of detail—installing systems and methods—will become simply matters of form.

Psychology in Purchasing.—Buyers and salesmen are diametrically opposed in a commercial sense. There must be some expression of this opposition, and the manner of the expression will be governed largely by the intelligence of the individual, particularly in the outward impression conveyed. Nobody can commend antagonism which can never do any good and may do much harm. On the contrary, a display of good feeling, even if it is fictitious, can do no harm even if it may do no good. The purchasing agent and the seller serve conflicting interests and are continually at war, but their feeling toward each other may be of the most cordial type, and based on the friendliest relations. The motives of sellers are never altruistic, however much they may so claim. It is well to remember that all sales are made for profit.

A salesman desires to produce an effect. What is the basic cause of it? The buyer's psychology will compel him to search for the cause. If the explanation is that the salesman wishes to convey the impression that his product has the same qualities as those of

his competitor—or better qualities—and yet is cheaper, the purchasing agent has to decide whether his statement is authentic, or whether it is made as an inducement because of the type of man the seller is dealing with. An easily influenced mind would yield to a well-directed verbal attack, but the intelligent person will investigate the reason why the statement was made. Such an analytical investigation may sometimes reveal extreme inconsistencies in what the seller says.

Reducing the Cost of Salesmanship.—A concern that spends a large amount of money in investigating, testing, and developing the materials for use in production work, until it has procured the raw material exactly suited to its requirements, does this for many reasons. One of the principal reasons is that the firm wishes to obviate the necessity of the seller's making such tests for the buyer, with their attendant uncertainties. Moreover, the concern realizes that all work of this nature done by the seller increases the cost of the material for the buyer.

The purchasing agent plays an important part in this development work. The greater his knowledge of his purchases, the less need is there for expensive salesmanship. Many buyers are paying for a salesmanship service that they do not need. A readjustment must come with the higher education of the purchasing agent, and also in those cases where the technical experts in his own organization have fully satisfied themselves of the merits and desirability of certain materials and articles. The readjustment may be slower in some industries than in others, but indus-

trial organizations generally should be in the lead in this development.

There should be some concessions to those concerns that employ engineering talent in order to determine in an accurate, scientific way the merits of anything they propose to buy. In other words, the buying concern—through the talent of its purchasing agent, or through its technical staff, or both—prefers to pay the cost of this determination and to arrive at the result by scientific means under its own control.

Technical Information.—A technical education is naturally a great advantage for a purchasing agent of an industrial establishment, but if this is secured by sacrificing other forms of education equally essential, or more so, to a successful buyer, then nothing is gained by it. There are many engineers, architects, and professional men whose technical training and ability enable them to take first rank in their respective professions, but whose commercial success is negligible, simply because they have no talent in that particular direction. The lawyers who amass large fortunes are not those who can best expound knotty legal problems, but those who can comprehend and grasp the commercial and financial problems of large corporations, or similar problems in the administration of large estates and trusts.

A new title is creeping into existence—the “purchasing engineer.” There are probably a great many who should bear the title, but who are still disguised as buyers or purchasing agents. Such men are invaluable if they have broad experience as executives, if their commercial education is of the kind that can

meet all contingencies, and if their technical knowledge of their own particular purchases is comprehensive and practical. There are sales engineers galore. It is now considered an essential part of a salesman's equipment to be technically trained. But quite frequently these men need technical education only in one line, whereas a purchasing agent needs a much broader training, for he has to buy a multitude of things, even if his concern manufactures a limited number of articles.

It may not be the province of the purchasing agent to determine technical questions, or even to select quality, but if he can do so, or give valuable assistance to those who do, he is to that extent more valuable to his concern and of great assistance in its economical developments and operations.

Policy.—The policy of the purchasing agent will naturally be the same as, or similar to, that of the establishment with which he is associated, but there are minor policies connected with his work and his department which every purchasing agent can formulate for himself. If he finds that these conflict with the general policy of the organization, he can bring them to the attention of the proper executives, and if his policies are big and broad enough, and worthy of being adopted, they will probably find a ready acceptance. They will also serve to enhance the reputation and standing of the author of them, for all organizations are looking for men who can formulate policies of this character.

Since the purchasing agent's department exists to supply the material needs of the other departments

of an organization, it is essential that he cultivate cordial relations with other department heads. If he does so, the many petty differences and frictions that are apt to arise between inter-department employees, can be controlled and smoothed out before they develop situations which could in the least impair the efficiency of any department.

Friendly relations should be established with all those concerns with which orders are placed and with which negotiations are conducted. Men will often do for friendship what they will not do for financial gain. A policy of recognized merit adopted and maintained as a standard with every concern the purchasing agent comes in contact with, will secure valuable and permanent advantages in all his transactions with them.

Authority.—There should be a clear definition of the purchasing agent's authority. He is virtually in control of a situation in which he can obligate his concern for very large amounts, for he can sign contracts and orders involving large expenditures. In this respect he can be compared, to a certain extent, with the treasurer. Would any concern permit its treasurer to sign checks and other obligations without proper voucher certificates or other accredited authorization?

In the first place, no purchase should ever be made without a requisition. This is the purchasing agent's authorization. These requisitions must be properly drawn, and signed by department heads or other persons empowered and designated by the proper officials to do so.

With these documents in his office, duly authenticated, a purchasing agent could—but no real purchasing agent would—throw aside all responsibility. The man who is alive to the necessities of the concern, who has its interests at heart and takes pride in administering the purchasing function, will scrutinize requisitions as much for under-buying as for over-buying. Market conditions are an important factor in determining the quantity to buy, and it may be necessary to make recommendations on this point to the party who signed the requisition.

When large expenditures have to be made for machinery and equipment, it would probably be necessary to get an authorization from the directors. If exceptionally large purchases have to be made for the execution of a contract into which the concern has entered, it may be necessary to consult with the sales manager and with the man in charge of the finances. Some definite scheme should be outlined, and a plan should be laid out by every establishment, governing the purchasing agent's authority. It is not wise, however able a man may be, to throw the onus of responsibility on him, neither is it wise to place it with some irresponsible foreman.

Natural Aptitude.—Neither intuition, nor natural aptitude, nor the “buying instinct,” will of itself alone develop a successful buyer for an industrial establishment. Different degrees of capability exist in different persons. The proper qualifications are largely acquired by association with the work of buying, but scientific methods and research work are necessary. Successful purchasing agents do not rely on

inherent knowledge, but upon that which is acquired. The final decision made by credit men in some cases is largely based on instinct or intuition. It is true that purchasing agents often close a deal satisfactorily on this basis, but they depend mainly on scientifically acquired knowledge. And it must be remembered that there is no finality to this work. It has been aptly said that "acquired knowledge is only elementary compared with the vast fund of information which is yet undiscovered."

From what has already been stated—in Chapter II, on "Specifications"—it might seem that the purchasing agent is so restricted in respect to what he shall buy that nothing is left to his imagination and very little to his judgment. To be sure, in the case of certain material the purchasing agent's work is principally a matter of specializing on price and delivery, since the question of what to buy has been predetermined by exhaustive practical experiments, the results of which are contained in the standard specifications furnished to him, which he uses in canvassing the market and placing his orders. It must not be inferred, however, that his work is merely clerical, for it is necessary for him to know something of the material that he is buying, and of the antecedent manufacturing processes through which it has passed.

If the purchasing agent's work were strictly confined within these limits, his outlook would be decidedly curtailed, but an interesting and important field of work would still be left him. However, there is no reason why his activities should be restricted within such limitations.

Wider Field for the Purchasing Agent.—I have emphasized in previous chapters the fact that the purchasing agent should be the final arbiter in the conduct and conclusion of all negotiations regarding price, terms, and delivery of all material for which he has requisitions. If he is a man who has a broad conception of his job, there is a larger field for him. For example, he may be consulted in regard to capital outlays. In this connection his knowledge of prevailing financial conditions, the causes which have brought these conditions about, and the probable future tendency, will be of service. And this knowledge is valuable in arriving at a decision as to the advisability, the manner, and the most opportune time to make an investment, whether it is in additional real estate, a new building, or better facilities for carrying on the undertaking.

So a very wide area of research work opens up for the purchasing agent, and there is unlimited scope for the acquirement of knowledge useful in his sphere of endeavor. Getting prices and information on materials needed, or known to be in immediate prospect, is only part of the work of the purchasing agent who keeps abreast of the times. He should be constantly absorbing information that will protect him against emergencies and ripen his judgment in the larger matters he may be called upon to decide.

A purchasing agent is employed to save money. He accomplishes savings through his knowledge of materials and markets, coupled with the ability to discover and select sources that can most advantageously furnish the requirements of the business.

There is an inherent satisfaction in bringing negotiations to a successful conclusion and closing a purchasing transaction satisfactorily. The work is interesting, and the interest is heightened by the breadth of the field it opens up for research work and the constant changes that take place in all classes of goods. Owing to the complexity of manufacturing industries, the finished product of one manufacturer is the raw material for another.

CHAPTER IX

THE PURCHASING DEPARTMENT

Origin and Mission.—There is no manufacturing process so simple that it does not require for the production work of its factory certain raw materials, and usually a large variety of tools and supplies. Other supplies and articles are needed by every section of an establishment, and it has long since been recognized that the responsibility for procuring them should be centralized. The organization of business concerns into departmental formation demanded that the buying function should be recognized—therefore the purchasing department was created.

The segregation of purchasing has important economic advantages. It has been found that a department specializing on market conditions, price, quality, service, and delivery, can obtain better results than can be secured through the division and decentralization of the work. Such an arrangement, moreover, enables all other departments of an establishment to devote their whole time to their special functions and activities.

All the material needs of an establishment should be obtained through the purchasing department. No exception of any kind should be made. Everything in the way of equipment, tools, supplies of all kinds—in

cluding coal, oils, stationery, printing and so on—is included under “material needs.” The practice of some executives, of permitting some of the minor supplies to be purchased by the departments using them is too common and cannot be commended. The principal purchasing work in industrial establishments is, of course, connected with procuring the articles, goods, and commodities which actually constitute the raw material for production work, or which, at least, are spoken of as such. It is essential that all supplies should pass through the department; otherwise standardization cannot be maintained.

Standardizing Supplies.—It may be noticed that those concerns which have been in existence for some time, and which have permitted the purchase of supplies through individuals in different departments have a promiscuous assortment and a bewildering array of articles. Standardization of all office equipment, stationery, and all supplies used through the factory can be effected more readily through the purchasing department than through any other medium, because it is the clearing house for all requisitions. Economical considerations and questions of convenience should compel attention to this fact. Certainly better prices can be obtained if standard articles are bought which can be used in any department. The advantages also of their interchangeability should not be overlooked. There is no logical reason why any purchasing of this nature should be subject to the vagaries and personal preferences of persons in various departments. The good of the whole establishment should be the paramount consideration.

In small industrial concerns the purchasing department can often be largely instrumental in standardizing much of the material as well as the supplies—especially if a technical staff is not employed to do it. This subject was covered in Chapter II in the discussion of standard definitions.

Relations With Other Departments.—The purchasing department exists, as a unit, in an organization to supply the needs of the other units. The attitude of the other departments will be a reflection of the purchasing department's service to them, and to a large extent the standard by which its efficiency will be measured.

The staff must be in sympathy with the particular requirements of the users of the material, or they will fail to grasp one of the most essential ideas in connection with the purchasing department. Just receiving requisitions, placing orders, and checking invoices is simply dealing with papers and accounts. Dealing with men and things inspires all employees with a different spirit in their work.

Every purchasing agent has had the experience of being told what is thought of his department when delays occur in getting delivery of some much needed material. It is assumed at once that the department is entirely unsympathetic with the legitimate aims of other departments. There is an appreciable resultant gain from the maintenance of harmonious relations between departments. The exercise of tact, discretion, and diplomacy by the heads of departments will establish and continue such relations, and it is no exaggeration to say that vast sums are lost where they

do not exist. The purchasing department is in constant contact with other departments, and co-operation and mutual confidence are absolutely essential. The question is merely one of being able to meet and handle the peculiarities and prejudices of human nature.

If there are points of contact where there is any question of the work overlapping that of another department, the duties of each should be clearly defined and arranged on the basis of the best interests of the whole establishment being served. Friction and the clashing of authority are in this way avoided, and the smooth working of the various activities is much facilitated.

Departmental Meetings.—The best antidote for misunderstandings is understanding, and this can best be brought about through departmental meetings. If there are a large number of employees, these meetings will be found very helpful in the allocation and assignment of work. It will often be found at meetings of this kind that the work is unevenly distributed. Temporary causes may be the occasion for this, and if a temporary re-alignment of the work can be made to relieve the situation a great deal of good will be accomplished. Proofs of this statement were plentiful during the strenuous periods brought about through the war, when it was exceedingly difficult to get shipment of certain materials. By the rearrangement of work and the assignment of more help to follow it up, great improvement has been effected.

It is not always possible, of course, for the head of a department to divide the work in such a manner that each section of the department will have the

same volume to handle. When consultation is held with each section independently, naturally a distorted viewpoint is often obtained; but joint consultation will remedy this trouble.

Compiling Records.—Intelligent records are a part of every successful purchasing department; the nature of these records has been treated fully in Chapters II, III, IV, and VII. The records should be reliable and accurate. Although records may be a part of, and an aid to, efficiency, they do not in any sense insure efficiency. Accurate records may be collected and used without any resultant efficiency, and, on the other hand, a certain amount of efficiency may be secured without the use of records. There is no doubt, however, that accurate records, make for the development of efficiency in the purchasing department.

Records must take note of existing surrounding conditions. There are elements which are ever present, causing continuous changes in business conditions and markets, and the compilation of records concerning them must be governed by experience and common sense. A qualified member of the department should have charge of collecting all the necessary data.

These records do not only portray the market conditions and fluctuations in prices, to which reference has been made in previous chapters, but they are needed as an aid in the direction, arrangement, and control of purchases, in order that without an undue accumulation of materials there may be, at all times, sufficient stock on hand to enable the production department to maintain its activities uninterrupted.

The requisitions, as they arrive in the department, will give the exact quantities required. Delivery dates should be specified on the requisitions, but it is essential for the department to keep a record of past purchases in respect to both quantities and prices. Other departments may send in estimates of future requirements, although unaccompanied by actual requisitions, and these will need to be recorded and tabulated.

Relations With Sellers.—Owing to the nature of the activities of the purchasing department, the members are brought frequently into contact with the representatives of the sellers. Most of these are salesmen, but the follow-up section of the department gets into touch with the persons in charge of shipments, and the invoice division has communications and interviews with the vendor's accountants and financial men.

The policy of the purchasing department, as displayed in its intercourse with outside concerns, will have considerable influence on purchasing efficiency. It is unfortunately a prevailing custom to adopt a different attitude towards firms and individuals from whom orders are expected, than towards those to whom orders are given. If the sales department considers it an essential part of its policy to treat with courtesy and consideration all customers, either in personal interviews or in written communications, it is an equally essential part of the policy of the purchasing department to adopt a similar attitude in their dealings with salesmen and in their communications with sellers. Unless this is done, it is exceed-

ingly difficult to get the best results in purchasing.

Every purchasing department has some callers who are perhaps not welcome callers, and probably every sales department has some customers it could just as well do without. There are all kinds of salesmen, and some of them will always think they are not getting a square deal. Many purchasing departments keep a record of salesmen's visits, and this is sometimes good practice, because it enables one to check up the progress of negotiations should it become necessary because of disputes concerning dates of quotations and the persons by whom they were made. It is also useful in discouraging visits from over-zealous and undesirable salesmen. Forms for recording salesmen's visits are given in Figure 27.

RECORD OF SALESMEN					
Date	Caller's Name	Representing	Interviewed by	Time	Nature of Business

FIG. 27. THIS RECORD CAN BE KEPT BY THE OFFICE BOY. IT IS SOMETIMES IMPORTANT TO BE ABLE TO REFER TO SUCH A RECORD AS THIS. ANY IMPORTANT MATTER DISCUSSED CAN BE NOTED IN THE LAST COLUMN BY THE EMPLOYEE OF THE DEPARTMENT WITH WHOM THE INTERVIEW WAS HELD.

Cost of Issuing Orders.—The conditions surrounding the work, and the nature of the purchases, vary so greatly that for comparative purposes little value can be attached to the actual cost of each order issued; nevertheless, a purchasing agent should have at least an approximate idea of the cost. If the operating expenses of a department can be reduced by curtailing the number of orders, it will pay to investigate this question with a view to consolidating many of the minor, or petty, requisitions.

Some discussion of this matter has appeared recently in the technical press. Supply houses that have been in the habit of receiving many small orders, ranging in value from fifty cents to a dollar, have put forth the claim that it is costing in the neighborhood of a dollar to issue each of these orders, and that it would be cheaper for the house to telephone for the small items needed, and have them delivered C. O. D. This is a poor argument. It is not worth a negative discussion, for its fallacy is apparent.

It is easy enough to compute with a fair amount of accuracy the average cost of orders issued, by assessing the departmental expense equally on the number issued, but one department may average ten orders a day, while another may average in the neighborhood of one hundred. In value of goods purchased, however, the larger quantity may not equal the smaller quantity. As already stated, it is advisable to know something of this question of value, for the same reasons that any executive must know what are the expenses of running a business. The principal point to consider is: Will a reduction in departmental ex-

penses be effected by reducing the number of orders, and if this is done, will there be any reduction in efficiency?

Practical Experience for Employees.—Many of the employees in purchasing departments are lamentably ignorant regarding the material used throughout the establishment. It has long been recognized that an essential part of a good salesman's training is a knowledge of what he is selling. Not just a knowledge of the price of goods, how much his factory has in stock or can make, and when it can deliver, but a first-hand knowledge of how the product is made, its constituent parts, and how these are manipulated and manufactured. It is a pleasure for purchasing agents to interview salesmen who can talk about their product clearly, concisely, and intelligently.

It is just as essential to purchasing efficiency that all the employees should have some experience in the shop or the stores, or in both. This has not been considered necessary by the majority of concerns, and the result is that it takes employees years to learn the distinction between various materials and tools. Moreover, they are continually referring questions to the head of the department or to his assistant which they should be in a position to answer for themselves.

By way of example: a man who was put in charge of the purchase-order record listed twist drills, electric drills, and radial drills all under one heading, and also classed together machinists hammers and pneumatic hammers. This man was exceptionally good in the accounting department, from which he

was taken, but when put on work that required at least a theoretical knowledge of materials, tools, and supplies, he failed entirely as far as keeping intelligent purchase records was concerned. On the other hand, there are firms that have secured excellent results by selecting the employees from hardware and machinists' supply houses, or by first giving their men some experience in their own stores or in the superintendent's office, where they come in direct contact with the goods that have been purchased.

Ethical Standards and Policy of the Department.—Graft is an ugly word. It is a raw term. Not all that is meant and implied by the expression, however, applies to existing purchasing departments—at least not to the purchasing departments of business concerns—any more than it does to any other department of a business. On this point I take direct issue, as a result of long experience, with the many assertions to the contrary which are made by disappointed salesmen, and which not infrequently appear in the public press. In no department are there greater opportunity and temptation to travel off the straight and narrow path, and in no department are there more insidious elements and conditions to contend with, than in the purchasing department. That form of graft which consists of bribery in any form on the part of any member of the department, I shall not discuss. The practice is vicious and demoralizing; the giver, the taker—in fact, any person involved in such a practice or having a knowledge of it—is not unaware of this fact. To deny that it is entirely nonexistent would be foolish. There are, however, many

other elements that thread their way through the operation of the purchasing function, which have perhaps a much greater influence on the proper and efficient exercise of it.

Reciprocal Agreements in Purchasing.—The sales department may wish to encourage and cultivate good relations with a prospective customer or a present customer who may be able to furnish certain material being purchased by the concern. Pressure is brought to bear on the purchasing department to favor this particular customer or prospective customer. If, in the process, anything is sacrificed in the way of price, quality, or service, then efficient purchasing has gone by the board. There is no favoritism in true purchasing. Orders are not given as “favors,” but because the recipients can stand up better than their competitors under the scrutiny and searching investigation of the purchasing department—because they have been found worthy.

The real buyer holds dear certain ideals and fundamentals in the exercise of his profession. Why should he cast these aside and throw them overboard to enable any other department to make a profit or put through a deal? Is that other department so little sure of itself that it cannot, on the merit of its goods or its proposition, carry on its own transactions without the assistance of a reciprocal agreement such as has been outlined? If the concern which it is proposed to “favor” with orders, is in as good a position as any other concern—or in a better one—to supply the needs of the establishment, the fact would have been discovered by any live purchasing agent.

It is altogether possible that another department may bring to the notice of the purchasing department, in the manner indicated, some firm or corporation which is eminently well fitted to supply part of its requirements; but if this is possible, there has been negligence on the part of the purchasing department in not discovering that concern itself. If, on consideration of all the factors which enter into right buying, it is found that a certain firm is on an equality with the best, then by all means let it have the business; but if it is not, then that other department should be notified of the exact conditions. The purchasing department cannot assume responsibility for buying anything on a reciprocal agreement which involves a departure from the fundamental principles of good buying. Reciprocity is probably the cause of more evils than unadulterated bribery.

Executive Pressure.—More unpardonable than the pressure exerted to bring about reciprocity, is the pressure brought to bear by officials and executives upon the purchasing department to make that department buy from some concern in which those officials are interested. Perhaps the officials are stockholders, or have relatives or friends who are interested in the firm in question. Some purchasing agents are not prepared to part with their positions, and will therefore give way to this pressure, disregarding the essentials of price or quality, or both.

Possibly an official may issue instructions that the purchasing department shall buy from some concern which has been brought to his notice by a friend, simply to do a good turn for his friend, and with no

ulterior motives in view. This kind of thing is often done thoughtlessly and heedlessly, but the instructions should be qualified, to safeguard the principles of purchasing, and with a due regard for the interests of the official's own corporation. If the instructions issued to the purchasing agent are not qualified, and would seem to be given in disregard of the fundamentals of good buying, then it is certainly up to the purchasing agent to make a report to the proper quarter.

In instances in which there are interlocking interests, the principles of buying are not involved. If any difference exists in the matter of price between what is paid and what could be obtained in open competition, it is probably adjusted by the ownership which is held in the selling concern. In such cases it is advisable for the purchasing agent to refrain from asking for competitive bids. There would be no prospect of their acceptance and the bidders would quickly "get wise to" the situation. To pretend that genuine competition exists when it does not, would seriously injure a purchasing agent's effectiveness.

Friendship in Business.—Friendship naturally develops when men of congenial dispositions are brought together in business life. There is a narrow minded element that would have the purchasing agent forego the privilege of selecting friends from among the men with whom he comes in contact. This element contends that it is not only questionable, but unethical, for a buyer to dine with a man whose commercial function is to sell goods. There are also some pur-

chasing agents who, aware of this attitude, impartially rebuff all salesmen, whether they are well-meaning or not, who strive to broaden a business acquaintance.

Any broad-minded purchasing agent will give friendship as readily and as quickly as he receives it, and if he does this to develop an embryonic friendship or to perpetuate one already formed, his conduct is right and may lead to great good. Many true friendships between buyers and sellers have been formed. But if the purchasing agent takes advantage of his office to receive special remuneration, he decidedly does wrong.

Friendship is a matter apart from money. It has been, and always will be, an important factor in business transactions. On a proper plane it is to be encouraged between buyer and seller, for it can be of great advantage to both parties. I have referred to this subject in previous chapters, and I have explained how valuable friendship can be when a buyer is suddenly called upon to purchase something new. To confer with business friends at such times is the quickest and surest way to find the best market and the best price. When it is difficult for a buyer to secure an article wanted quickly, a seller, for the sake of friendship, will undertake to supply it, and will put himself to much inconvenience to do so. Friendship can be cultivated even through the very manner in which a salesman is told he has lost, or cannot have, an order. These may seem small things, but courtesy, square dealing, honesty, and straightforwardness beget friendship. They are appreciated

by sellers, and the buyer benefits very largely from them. The small effort expended in this manner will bring returns when least expected, and to a much greater extent than could be anticipated from the effort made. Friendliness is a natural qualification of some buyers; it should be cultivated by others.

There are ethics of selling, as well as ethics of buying. Many business houses have adopted and maintained a certain standard of conduct in their relations with other firms, and have built up and firmly established a reputation for themselves on this standard. There should not be mutual suspicion and distrust between such concerns and buyers who measure their motives by the highest standards of honor and conduct governing their motives, for the principles of both parties are identical.

Effects on Whole Department.—The maintenance of a standard in purchasing is not the particular privilege of one man. Any attempt to pervert these standards is usually attributed to a desire on the seller's part to secure an order at a higher price than is justified, but this is very rarely the case. Inflated prices are very easy to detect, and returns are not commensurate with the risks incurred. Degrading quality is a simpler and easier method. Such procedure involves the persons in charge of inspection, or the receiving clerk. If inspectors are sent to the seller's plant to examine and inspect material before shipment, they must be men of proved character and dependability.

It is futile to contend that the extension of scientific methods eliminates all forms of dishonesty. It does

help, materially perhaps, through the safeguards erected. But independently of this, buying, as a commercial pursuit, stands on a higher plane to-day than it did even only a few years ago. This development will undoubtedly continue. Many of the little tricks, misrepresentations, evasions of contract obligations, withdrawal of accepted quotations, divulgence of a bidder's price to a competitor, and innumerable other similar expedients, are fast disappearing from both the buyer's and the seller's methods. Their relations are being established on a better basis—a basis which, according to present-day standards, should be designated a businesslike basis.

A few other points in connection with the policy of the purchasing department are so well expressed in the following quotation that I include it here. The extract is from a speech entitled "The Cultivation of a Higher Code of Business Practice and of Business Ethics," delivered at the twentieth annual convention of the National Association of Credit Men.

Am I not safe in saying that we have no greater and no more urgent task than this? The unbusinesslike practice of allowing bills to run after maturity, the exaction of unjust claims and allowances, the rejection of goods shipped on bona fide orders, the deduction of discounts after the discount period has expired—are not these abuses the bane of every credit department? And why? Because there has grown up in our land too light a regard for the binding obligation of a contract. An importunate desire for immediate gain has usurped the place of honor. We need to assert that the placing of a bona fide order confers a property right that cannot be rescinded except at the option of the vendor; that after a shipment has been received and accepted, the shipper is justly entitled to payment in full, according to the contract, without

unjust deduction; that time is of the essence of the contract—therefore, the bill should be paid promptly at maturity; and that the taking of a discount, except within the discount period, reflects upon the honor of the man or firm deducting it. Too long have we acquiesced in these evils. Perhaps we are in part responsible for their existence. It now devolves upon us to put them without the pale, as unbusinesslike, unethical, and unwarranted in practice or in morals.

Outline of Work.—In preceding chapters I have dealt with many phases of the work of a purchasing department. Before discussing the organization necessary to carry out this work, I wish to give the following detailed survey of that work and a résumé of what it embraces:

1. The purchasing procedure. That is, the receipt of the requisition; its proper examination; the various checks to which it is subjected; establishing a price for the material requisitioned, either from contracts or by obtaining new quotations—this step involves comparison of the bids received; negotiations with the successful bidder; arranging all the terms of contract; and finally, closing the deal and placing the order.
2. Getting delivery of the order. Following up the vendors; arranging for inspection, as stipulated, either at vendor's factory or at destination; possibly arranging for transportation and tracing while in transit.
3. Receiving the invoices; submitting them to proper checks, to make sure that they are strictly accurate in every way, and that they represent exactly the price, terms, and quantities stated on the order; finally, approving them for payment.

4. The collection of information necessary and useful to the department. This information must be tabulated and recorded in such a manner as to be available for instant use. Practically every member of the department should have access to such data. One of the principal things to keep in mind is the necessity for clearness and lucidity. This accumulation of information includes catalogues and all literature considered essential for the department. Some forms for recording this information have been given in earlier chapters, and others will follow in the discussion of the respective subjects.

These, in brief, are the operations the purchasing department covers. In later chapters on routine work they will be closely followed, step by step, and each detail will be explained. The above summary is intended as an outline that may render the more intelligible the discussion of the organization of the department, which follows.

Organization.—The size of the department will, of course, conform to the needs of the establishment. It is impossible to lay down any set rules in regard to this point. I have been frequently questioned concerning the requisite number of employees, and in such instances the information on which I was expected to base an opinion was the number of men employed in a factory, the capital of a corporation, and other features which have only a very indirect bearing on this point. The number of employees is determined by the amount of work, and the calibre of the em-

ployees by the importance of the purchases. It is impossible to decide a question of this character without first making a close examination and scrutiny of the work. Conditions vary in every concern, and individual necessities determine in every case.

Establishments that are concentrated in a group of buildings, with the stores in close proximity, can handle the purchases with less help than those that have several factories, scattered over a wide area. Requisitions for an amazing variety of materials pass through some purchasing departments, making the amount of detail work far greater than it is in those departments that buy a limited variety. Then again, it is possible, with some materials, to place long-time contracts; in cases of this kind the work is considerably lessened, as it is not necessary, under such circumstances, to canvass the market so often. All these features and many others determine the number of employees requisite to carry on the work efficiently.

Irrespective of the volume, there is a well-defined course through which the work must pass. I propose to outline this course. In accommodating it to individual conditions, it may be found necessary in small departments to amalgamate some phases of the work, while in large departments the handling of what is called a "one man's job" may require several men.

Figure 28 illustrates in a diagrammatic manner the organization of a purchasing department. The duties of each member are briefly outlined in the following description.

The Purchasing Agent.—This man will have the general management and supervision of the depart-

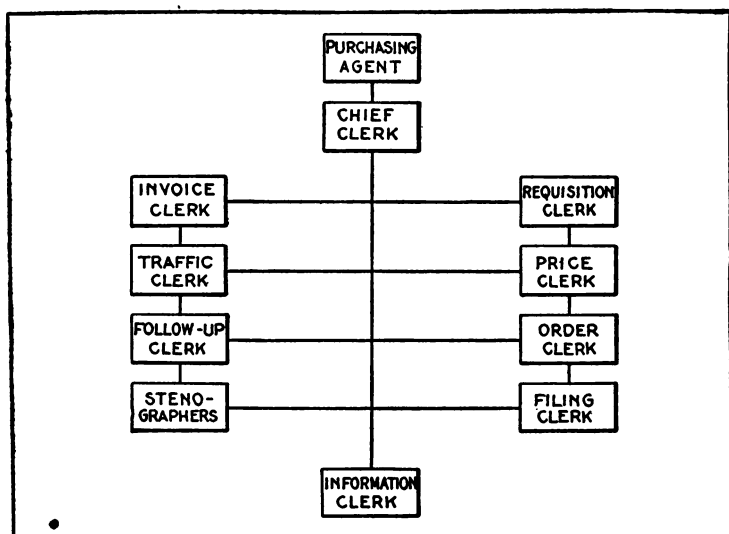


FIG. 28. ORGANIZATION DIAGRAM OF PURCHASING DEPARTMENT.
SEE TEXT FOR EXPLANATION.

ment and will direct its policies. He will consult—whenever occasion requires—with other department heads, such as those in charge of the production department, sales department, accounting department, and financial department. Except for some minor details, he should settle all differences concerning relations with, and connection between, his department and another. He will personally conduct negotiations, and will close all large and important contracts. If these are vital to production work, he will oversee the progress being made by sellers, and probably will arrange for inspection or tests to be made. He will have to interview many callers; he

will have to adjust any serious differences that may arise with vendors. He will indicate to his assistant or chief clerk the sellers who he believes should bid on certain materials. He will have to keep himself posted on prices of commodities, on financial problems, on all business features which could affect the purchasing function—in short, on business conditions generally. He will be the inspiration of his department, and its responsible head. When the purchasing has to be done for several factories or branches, and local buying is necessary, the department head might take the title of General Purchasing Agent. He would then have an assistant, who would assume a portion of his work, subject to his general direction. In the absence of the General Purchasing Agent, his assistant would be supreme.

Assistant Purchasing Agent, or Chief Clerk.—In some purchasing departments, it may be advisable to have both an assistant purchasing agent and a chief clerk. In such a case the chief clerk will take control of, and be responsible for, the clerical work of the department, while the assistant purchasing agent will be his superior and will assume some of the duties of the purchasing agent. Whichever title is held by the man next to the purchasing agent, he must take as much detail work off the head of the department as practicable, in order that his superior may have as much time as possible for consultation and for the larger affairs of the department. He will have to interview some of the salesmen, and he should also, if possible, see all requisitions as they arrive in the department, and then turn them

over to the requisition clerk. He should see all correspondence intended for the purchasing agent; he will handle part of the correspondence relating to bids, designating the firms from which quotations are to be requested. He will be responsible for the discipline of the department, administer the policies of the purchasing agent, and generally direct the routine work.

Requisition Clerk.—All requisitions should go to the requisition clerk to be checked for authentication. The specification should also be checked. It may be possible to arrange for this man to keep the purchase-order record, as explained in Chapter II. He should see that quantities are properly stated, and also the point and time of delivery, and so on. In brief, he should see that the requisitions are in correct shape to be dealt with for price-getting and ordering.

Price Clerk.—The requisition will pass to the price clerk from the requisition clerk. He may keep the records of prices, both current quotations and those prices established by existing contracts. If there is a price established by contract, he will insert it on the requisition and pass it along for the order to be written up. He should see that requests for quotations are properly written up, and should keep a record of the best sources of supply, if there is no general information clerk for this work.

Order Clerk.—The order clerk should receive the requisition after all questions regarding specifications, price and delivery are settled; then he should write up the order. He will be responsible for the proper

wording of the orders and for checking them, as well as for the distribution of the copies to interested parties or departments.

Follow-up Clerk.—The follow-up clerk will be responsible for following up and getting delivery as specified on the order, and will report at once to the chief clerk when he is unable to get satisfactory assurances, or when delays of any kind occur. He will have to turn over to the traffic clerk all details of orders which he will be required to trace. He must also advise the various departments regarding promises of shipments, and must promptly notify them of any delays.

Traffic Clerk.—This man will be responsible for tracing all shipments while in transit. He must be posted on freight rates and classifications, and must give information to the chief clerk, whenever necessary, regarding best routes between shipping point and destination and probable time required for transportation. He will be required to check all freight and express bills, as well as all freight allowances or charges on invoices. Finally, he should adjust all claims against transportation companies.

Invoice Clerk.—The invoice clerk will receive and be responsible for all invoices. He must get them approved before the discount date expires, and must check them from every angle to see that they conform to the order in every way. Quantity, price, and delivery, must be verified. Prevention of duplication must be certain and positive. He must take up with sellers all discrepancies—with the understanding that any decisions of his are subject to the approval of the

chief clerk—obtain credits for these, and generally adjust all differences. Finally, he must keep close track of all invoices, to insure their approval in time for the financial department to pay them on the date that was agreed upon.

Information Clerk.—The information clerk will have charge of catalogues, and should properly index and classify them. He should keep all records as directed by the chief clerk, and should see that they are always where they may be referred to by any member of the department. He should be able to quote market prices and recent prices to other departments and to give them information concerning available suppliers. When any new material, or a special tool, is wanted, he should be able to state or ascertain quickly where it can be procured.

General Arrangement of Department.—There are many minor activities connected with stenographic work, receiving callers, mailing, and so on, which are common to every business office and which I shall not discuss in detail. In the diagram of a department, shown in Figure 28, no provision is made for inspection. When this part of the work comes under the jurisdiction of the purchasing department, it will be taken care of by the purchasing agent or the chief clerk, provided the inspection is carried on at seller's warehouse or factory; in these cases the orders are probably of sufficient importance for one of these persons to supervise delivery. If the inspection is done at the factory, it may be independent of the purchasing department. I shall state instances of this kind

later, in connection with the work of the storeskeeping department.

The organization of the personnel of a purchasing department is bound to vary with circumstances and conditions. The work may in some instances be found to be much heavier in some sections than in others; if so, a rearrangement to meet this condition can be easily provided for. Where a large number of purchases are made, it may take as many clerks to check and handle the invoices as it does to check requisitions, price them, obtain quotations, and place orders. In many purchasing departments each section keeps such records as it requires for its particular work. Generally speaking, however, this practice is not to be commended, since it usually means duplication of work; a common information bureau, if properly arranged and easy of access, is the preferable method.

The work of any purchasing department must be organized on some comprehensive scheme; moreover, the work itself must follow a route that is arranged in logical sequence, in order that it may not by any chance undergo duplication or backwardation. The aim should be to plan a route for the work with a definite object in view, coherent and thorough. Over-systematizing must be avoided; if it is indulged in, it will lead to confusion and will be a menace to efficiency. On the other hand, an incomplete system will render the work laborious. The justification of a good system and good methods is their effectiveness in covering with accuracy and despatch all the points comprehended in the work of the office. It will main-

tain order, regularity, and expedition. A good system is dictated by common sense. It has to be administered by the organized office staff which has all the human frailties to contend with. The better coordination it can bring to their efforts, the greater its potentialties for success.

CHAPTER X

THE PURCHASING LIBRARY

Books.—The number of books a man possesses on any subject is largely the measure of his interest in that subject. The existing literature on purchasing is exceedingly limited, but nevertheless the student of that subject has a very wide field from which to select his reading. There is scarcely any book published on any business subject from which he cannot glean something which will broaden his knowledge and add to his value to his profession and to his concern. For this reason, it is expected that a purchasing agent who is truly interested in his work will own many books on business methods and practices.

The day has passed when any business man can learn by experience only. Would a doctor, a lawyer, an engineer, a midshipman, an army cadet, or would any advertising man, salesman, or accountant think of reaching the highest niches in their respective professions through experience alone? It is possible today to save oneself many hard knocks by taking advantage of the experience of other business men as recorded in their reliable data.

The output of business books has been on the increase during the last few years, and the publishing

houses that have issued these books have made a definite contribution to the business world. Likewise, the libraries that have recognized their opportunity to render a specialized service to business men, have added much to the general betterment of business.

Books dealing in a methodical, cut-and-dried manner with any business subject are not the only books that the purchasing agent will find it worth his while to study. It is becoming more and more evident that the very best tonic for the business man is the reading of inspirational books. Those which set standards and ideals, which command our respect are always worthy of a place in the library.

It is impossible to name any particular book, or to give any list of them, suitable for the students of purchasing. Selections can be made from the catalogues of publishers of technical and business books, and good reading can always be found in any public library. A book which is an excellent guide to reading, and which should prove valuable to any person who wishes to get a comprehensive list of business books, is "Sixteen Hundred Business Books." It was compiled by Sarah B. Ball, of the Newark, N. J., Public Library and is published by H. W. Wilson Co. of White Plains, N. Y.

Periodicals.—Foremost among periodicals suitable for the purchasing library is "The Purchasing Agent." It is ably conducted, and always has some information of value to those engaged in purchasing. It may well be given a place in every purchasing agent's library.

For those buyers who must be posted on the daily fluctuations in the prices of metals with information concerning output, movements, and available stocks, as well as in regard to estimates of production, there is "The American Metal Market."

"The New York Journal of Commerce" is exceedingly valuable for the student of general business conditions, commodity prices, and commercial matters of interest. "The Annalist," a weekly publication, is an excellent medium for those who want the technical and business information without the general news items.

Those interested in foreign trade conditions should have "The Americas," published gratis by the National City Bank of New York. There are several publications which make a specialty of industrial management, and also many devoted to particular industries, such as hardware, textiles, woodworking, paper, cordage, coal, and so on.

Not only are all these periodicals valuable for information concerning prices, commodity movements, and general business, but their advertising columns are worthy of scrutiny, for it is through these that it is often possible to enlarge one's market and field of operations in buying.

Registers and Agencies.—It is almost impossible for a purchasing department buying a large variety of articles to get along successfully without one of the well-known registers, such as Hendrick's or Thomas's. These are compiled with great care and are very comprehensive, but, as explained in Chapter II it may be necessary to take the lists given

them and further subdivide these, segregating the firms that are best fitted to supply one's special requirements.

In order that it may be possible to determine the financial standing of concerns with whom business relations are contemplated, the library should include either Dun's or Bradstreet's reference books, or perhaps those of such agencies as Proudfoot's and Moody's. Through these, practically any information deemed necessary can be obtained, including names of members of firms, officers of companies, and so on, and special reports of all kinds.

There are other sources from which much information can be collated by the purchasing agent. Many trades have an agency that disseminates news for its particular field. Babson's Statistical Organization, for example, issues to subscribers exceptionally good information based on scientifically collected facts and data.

Catalogues.—Every well-ordered purchasing department contains a comprehensive equipment of catalogues. Not only those which are pertinent to regular purchases should be kept, but also those covering goods in which it is likely that one may be interested at any future time. It is also advisable to have catalogues of manufacturers who make component parts of some article or machine. For example, one may not buy cut gears, but if one is buying some machinery or article of which cut gears are a part, then a gear catalogue is valuable for the information it gives.

It is impossible even to estimate the amount of

money spent annually on catalogues, but the total must be stupendous. The wastage, of course, is enormous, but to set against those catalogues which are lost forever are those which work overtime. Taking it all in all, the expense must be justifiable or the custom would have been discontinued or shown a tendency to die out, whereas, as a matter of fact, it is undoubtedly increasing.

There are many concerns that get a large proportion of their business through catalogues. The great mail-order houses sell their entire line through this medium. On the other hand, some products could perhaps never be sold without personal explanation and solicitation. A catalogue is an advance agent—it is on the ground to give preliminary information, and is frequently the precursor of an active order.

To the purchasing department, catalogues are of great value. Other departments, also, find frequent use for them. The estimating department may want to look up some valve which is specified by a prospective customer; the shop engineer may wish to know the foundation plan of a boring mill; the drafting room may require to know the channel sections rolled at a certain mill. Questions are constantly being asked the purchasing department regarding sizes and styles of very many articles, and it must be prepared to answer fully and accurately.

The purchasing department should have complete charge of all catalogues for the whole establishment. It acts as a clearing house for information needed by other departments, and in order that it may meet the demands made on it, a complete installation must

be maintained, and kept in such shape as to be available for quick reference.

Technical Information in Catalogues.—The value of technical information in some catalogues is not always fully appreciated. It must be remembered that this information is written by highly trained practical men, experts in their particular line. Generally it is compiled by men who love their work, and whose ideals are the perfection of their product. Primarily, of course, a catalogue is an advertising medium, and advertisements cannot always be taken at their face value, but if the advertising manager uses the knowledge and services of trained technical experts and inserts it in a catalogue, without alteration, the value of the information is not lessened. The matter contained in catalogues forms a liberal education for any persons engaged in purchasing work. The modern tendency in catalogues is exactness in the claims made, so that specific statements can usually be relied upon. As regards general statements, they are sometimes apt to be rated above par.

By way of illustration I shall take, at random, a catalogue of leather belting. It contains an exhaustive treatise on hides. Their physical characteristics are explained, the difference in the texture of hides from different breeds of cattle is pointed out, and it is shown how these need a variety of care in treatment during the tanning process if a sufficient degree of uniformity is to be obtained. The progress of the hides through the tannery is minutely detailed. Illustrations of hides are given, showing in

what manner they are cut and trimmed, and for what purposes the backs, shoulders, centers, and sides are used and how they are graded. Next, there is a disquisition on the effects of acids, oils, water, and so on, on leather; an explanation of how belting is manufactured; how to order belting; how to figure horsepower transmitted; how to fasten belting; how to figure speed of pulleys—in fact, every conceivable mechanical condition is explained, and rules are given in connection with them. All types of belt drives are illustrated, and the necessary data are given with which to figure them correctly.

A catalogue of drop forgings gives a history of the art, what the process is, how dies are made, the effect of heat treatment on metals, what carbonizing is and why it is done. An explanation of case hardening follows, with suggestions as to its employment for certain purposes. Micro-photos are shown, illustrating structural differences developed in steel by varying its treatment.

There are many catalogues of tool-steel manufacturers, which give much valuable information regarding steel processes. Beginning with the iron ore, the description makes clear in what manner oxygen is separated from the iron, and deals in detail, step by step, with the various treatments to which the metal is subjected until high-grade steels are produced by the introduction of different percentages of manganese, nickel, chromium, tungsten, vanadium, and so on. Then follow details regarding forging, hardening, tempering, and annealing.

Manufacturers of insulated wires and cables give

the dielectric strength of different forms of insulation; the properties of resistance wires; a fund of information on electrical matters; tables of sectional areas; comparisons of wire gauges; and many other features which at some time are essentially involved in purchasing work.

I could continue these illustrations indefinitely, but I have already given enough to show the great value of catalogues in the education of the purchasing department. Quite often the technical staff, also, depends upon them for information. A well-selected list of catalogues, properly arranged for reference and consultation, is therefore a necessary and valuable adjunct to any purchasing department, from an educational point of view alone.

Standardization of Catalogues.—So much publicity has been given recently to the standardization of catalogues, and there has been so much discussion in regard to the subject, that a tremendous impetus has been given to the movement. Tangible results must certainly follow. Since the matter is one in which all persons engaged in purchasing have a large interest, it is well to note in what manner the change will affect them.

The present catalogue system has grown up without any consideration of uniformity. Each manufacturer has apparently looked on the preparation of a catalogue from one point of view only—his own. The buyer's interest and convenience in the matter have never entered into his calculations. It therefore becomes necessary for the person who must find accommodations for a large number of catalogues, to

provide for an endless range of sizes. This requirement, of itself, involves the loss of much valuable filing space. Furnishing catalogues in bound books, each book containing information on many articles, also compels the buyer to study a number of separate bound volumes, handling countless pages relating to other material, which at the time holds no interest for him.

The high cost of buying and the high cost of selling will both be appreciably lowered by the change which is coming, and for which every purchasing department should be prepared. Today many thousands of price lists, circulars, and data sheets received by buyers are consigned to the waste paper basket because the buyers have no method of properly filing them, or because owing to the variation in the size of catalogue, their facilities are already overcrowded.

The tendency in the movement for standardization is toward the issuance of all catalogue matter in bulletin form. The bulletins will include everything pertaining to catalogues—price lists, illustrations, data charts, tables of sizes, and so on. All the bulletins will be of uniform size; it looks, at present, as if the $8\frac{1}{2}$ x 11 inch size would finally be adopted. A manufacturer who makes several articles will have a bulletin for each article. This bulletin plan has already been put in effect by some manufacturers, but without any agreement among themselves as to a uniform size, and in many cases the bulletins are made to fit special binders—they are then really no better than the ordinary old-fashioned catalogues.

The principal advantages to the purchasing depart-

ment of the new scheme of standardization are, briefly, the following: All bulletins from every manufacturer, pertaining to an article or a material, will be filed together, and when it is necessary to look for information on any particular article or material, it will be found located in one place. It will not be necessary to make a search through many catalogues, some with the index in front, others with the index at the back; some with prices attached, others with separate price lists. These catalogues, under the present system, are scattered all through the files. There are many other points of advantage to the buyer, which I shall not enumerate since the scheme is not yet an accomplished fact; it will certainly be adopted, however, and every purchasing department should be posted regarding its main features.

Procuring Catalogues.—A search through the advertisements in the trade publications covering the manufactures in which the purchasing department is interested, will reveal the names of many concerns to which applications for catalogues may be made. Visiting salesmen will speedily arrange to have their respective houses forward catalogues, many of which will be mailed unsolicited. Catalogues are a distinct asset.

The extent to which the accumulation of catalogues should be carried, must be decided by each department for itself. It sometimes seems to me that no catalogue which is issued should be discarded. In my own firm, calls are made on the department for a tremendous variety of articles, because of the wide-

spread and varied activities of this company. Undoubtedly, however, in the great majority of instances there is a limit beyond which the collecting of catalogues should not be carried. This is particularly true in industrial establishments that manufacture a single line of articles or machinery. In such cases, only those catalogues that describe the material or equipment for which there is immediate or prospective need, should be accorded a place in the files of the purchasing department.

Filing Catalogues.—It is not possible to do very much in the way of grouping catalogues, except in the matter of size, and in this respect they can be segregated into five or six groups. These dimensional groupings can be readily recognized in the index from the key letter prefixed to the number. For instance, B146 would be in the B group, and could be found much more quickly than if it were in numerical sequence irrespective of the group in which it rightly belongs.

The grouping together of all catalogues for one class of material has the advantage of enabling a person to select quickly all the catalogues on one subject, but in every other respect such a scheme is a dismal failure and cannot be recommended for use in connection with any ordinary file. Catalogue filing, for the reasons given, is loose, ragged, and uneconomical under the best conditions, so far as space occupied is concerned, but in keeping all catalogues on one subject together every one of the disadvantages is greatly aggravated.

In addition to the catalogues in the form of bound

books, in every purchasing department there are almost innumerable pamphlets, circulars, price lists, and so on, which it is necessary to keep and file. These can be kept in cartons, envelopes, or folders, of uniform size, and a section of the catalogue filing case can be devoted to receiving them. There is no difficulty in segregating these and in keeping pamphlets pertaining to a certain material in one carton or folder.

It is, of course, imperative to maintain a complete cross-index under the name both of the supplier and of the material, as shown in Figures 29 and 30. It is also essential to have a record of those catalogues or documents removed from the file and taken out of the department. The latter procedure can be taken care of by inserting cardboard dummies in the files in the place of removals. On these dummies a record should be made of the disposition made of the originals. A record can also be kept on the index card, or a special card can be kept upon which may be entered a memorandum of all documents taken away and the names of the persons to whom they are delivered.

Universal Standard Catalogue System.—R. M. Hooker, formerly President of the Catalogue Cabinet Company, of New York, who has operated catalogue libraries for over twenty years, has devised what he terms "The Universal Standard Catalogue System," and is publishing indexes to the catalogues issued by the different trades.

These indexes assign a number to each catalogue, so that the user may have a completely indexed

library of catalogues, if he will number them and arrange them in accordance with the index. The numbering is so arranged as to group catalogues automatically according to their subjects. The indexes are supported by the advertisers, and are free to any users of catalogues. Labels to paste on the catalogue may be procured from Mr. Hooker. These labels give, in addition to the number of the catalogue, a description of it, so that the user may easily identify the catalogue to which the label belongs. The saving in labor will more than pay the cost of these labels.

The cabinet designed to accommodate catalogues under this system is unique, in that it is so arranged that there is no excuse for misplacing a catalogue. Cartons are furnished of uniform width, but of varying depths and thicknesses. Therefore any catalogue or group of catalogues can be enclosed in a carton of suitable depth and thickness. The maintenance of a uniform width for the cartons means that material will not slip and slide about in the file. The fact that these receptacles are dust-proof is a valued feature in many offices.

Any ordinary bookcase grouping of catalogues by subjects entails considerable loss of space, because of the inequality in the sizes, but in this system economy of space has been considered and the loss has been reduced to a minimum. The same advantages could not be obtained in any other way.

The Universal System and Standardization.—The most important aid to convenience in the filing of catalogues, is the rapid adoption by manufacturers

of the standard-size bulletins recommended by the American Institute of Architects and other technical societies. These bulletins should be 8½ by 11 inches, without covers, and each should treat of but one subject, so that they may be filed in any letter file, and distributed according to subject.

These standard-size bulletins, when filed in the folders invented by Mr. Hooker, and used in connection with his index, undoubtedly constitute the most practical solution of the catalogue problem yet offered. The folders are devised to contain the bulletins in such a manner that they can be opened flat without being removed from the folder; moreover, they are fastened to it, so that it is impossible to misplace them. The folder is prominently marked with the group number. When standardization has made sufficient advance to warrant the adoption of this system, it should command very wide attention.

CHAPTER XI

THE USE OF CHARTS AND DIAGRAMS IN PURCHASING

Figures and Charts.—Every purchasing department is interested in compiling, assembling, and recording facts and data connected with materials purchased and consumed. These facts and data may be quantitative, or they may indicate fluctuations in prices and quotations covering varying periods. It is also desirable in some cases to have statistics regarding the particular materials or commodities that bulk large in the activities of the establishment.

Accurate data and facts are extremely important and valuable, but if they are not clearly presented the results to be gained from them do not show up as they should, and consequently lose much of their force. The proper presentation, therefore, of these records is ordinarily of as much importance as the facts themselves.

If, for instance, a tabulated list of figures is being considered, or is under observation, and these figures indicate the consumption or purchase of a commodity or article for a number of months or years, denoting frequent increases or decreases, it is a matter of some difficulty to get a comprehensive grasp of them, as compared to the ease with which the same facts can be assimilated if they are presented so as to be

readily visualized in the shape of a curve, diagram, or chart.

When totals are merely footed, each conveys separate facts, however lucidly arranged; but when totals are connected up intelligently in a chart, a succession of facts is presented each of which, while it retains its particular value and place, is a component part of the whole, larger fact that is being demonstrated in unbroken simplicity.

Figures are for recording purposes, and convey pictures of weight or size. Many people think of these pictures, and not of the actual figures. Curves, charts, and diagrams are reproductions of these pictures, proportioned to a range of vision that makes them almost instantaneously intelligible. Before figures, weights, or measures were used, these mental pictures of bulk were obtained by the ancients by crude, but similar, means. Examples of these are found to the present day in the terms "foot," indicating measurement, and "stone," under which designation annealed binding wire is still sold. In commercial usage, "stone" indicates twelve pounds.

When figures are put in the graphic form of curves and diagrams, not only is there a great saving in the time of the reader, but there is the tremendous advantage that one can absorb more facts with less danger of misinterpretation. It would be to the advantage of any purchasing department to present in this form all numerical comparatives or fluctuations in prices for the assistance of the executives of the establishment, and for the information and guidance of the department itself.

Value of Charts to the Buyer.—When very large purchases are made of some commodity, and particularly of such things as valuable metals, it is vital to good buying that statistics be kept of production, consumption, and visible supply, and that these statistics show variations in these items, together with fluctuations in prices. Not all purchasing agents are interested in expensive metals, except as they may serve to indicate the general business conditions and the prosperity of the country. Purchasing agents should, however, be posted—as should all business men—on anything which is liable to affect commerce and industry. Probably every purchasing agent is buying something regarding which he should have reliable information clearly set forth and, rather than depend on a mass of figures, he will find it preferable to use some simpler means of portraying that information.

The simplest and most generally used form of curve is that which indicates fluctuations in commodities. This type is seen frequently in the journals and trade papers devoted to the interests of some particular product or commodity; it is illustrated in Figures 31 and 32. Usually the advances and declines in the commodity in its raw condition are shown, but most purchasing agents are chiefly concerned with material in its semi-manufactured state—for instance, metals in bars and sheets—and they must know the exact variations in price of the commodity in the condition in which they buy it. The periodicals to which a purchasing agent has access cannot always be depended upon to give him

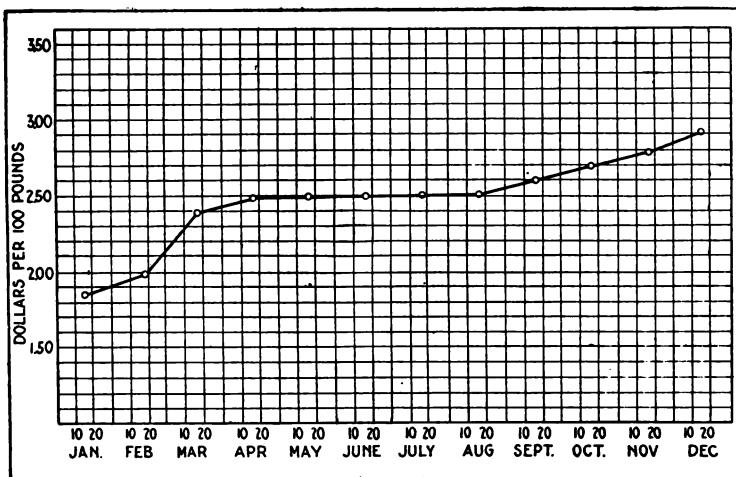


FIG. 31. CHART SHOWING RISE IN STEEL PRICES
DURING ONE YEAR

Practically every article of which steel is a component part followed this advance

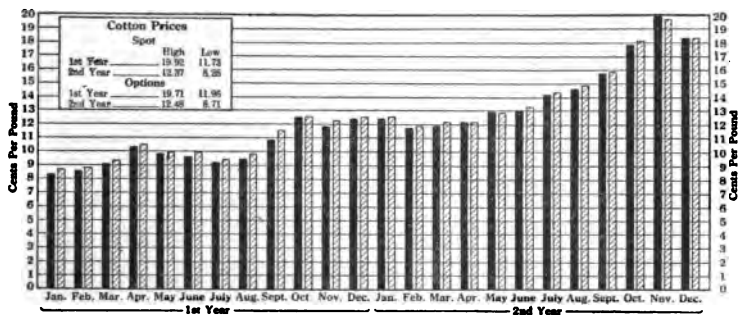


FIG. 32. SPOT AND OPTION PRICES OF COTTON FOR TWO YEARS

This is an excellent method of portraying quantity, because it represents bulk in a more forceful way than a line chart does. (Courtesy of *The Annalist*.)

the information he wants in the way in which he wants it presented. The necessity therefore arises for him to collect this information and convert it in his office into the forms in which it will best meet his requirements.

A point which all buyers should bear in mind is that almost invariably any change in the price of a semi-manufactured article is preceded by a corresponding change in the price of the raw material which enters into it. A chart showing both curves would be a valuable aid in determining the psychological moment to make a purchase. By way of illustration—the fluctuations in the price of hides would undoubtedly be followed by corresponding variations in the price of leather belting. These fluctuations would be noticeable, in a lessened degree, in those articles in which leather is a small component part.

Another simple graphic form—used principally to set forth quantitative facts—familiar to every person who follows up such matters, is that which consists of diagrams with vertical or horizontal parallel lines, each of which denotes a certain fact for a stipulated period. This form is used mainly for showing the production and consumption of commodities. It can be used to great advantage in the purchasing department in connection with all those articles of sufficient importance to warrant the preparation of charts. These diagrams are aids to buying, since they indicate accurately the exact period of the year when consumption is largest, and the exact consumption for each period. In some cases they are not so well adapted as the line charts

for demonstrating these features. They are, however, superior in some respects, since a variety of geometric symbols can be used, and a different symbol may be used in connection with each article. Another advantage of this form is that these diagrams convey the impression of quantity and bulk more forcibly than the curves in a line chart. (See Figure 32.)

The two charts shown here are simply offered as suggestions. It rests with each purchasing department, individually, to decide what charts shall be prepared. For example, if a curve indicating the price of wire nails is kept, it will be found to bear an almost exactly parallel relation to the price curve of steel beams. Allowance being made for variations in production, all other steel products would follow a similar source. In the case of large buyers of cotton duck, the variation in price can be approximately gauged from the price of raw cotton.

When accuracy is desired in the price curve of any article, that curve must be based upon the actual prices of the article itself. Approximate prices only can be obtained of manufactured articles from raw-material price curves. For example, there may be an over-production of wire nails, but other industries that consume steel may be taking vast quantities of raw material, depleting the market and advancing the price. Until the over-production of wire nails had been worked off, the price of them would not advance in the same proportion as the price of some other steel products, and consequently there would be irregularity for a time.

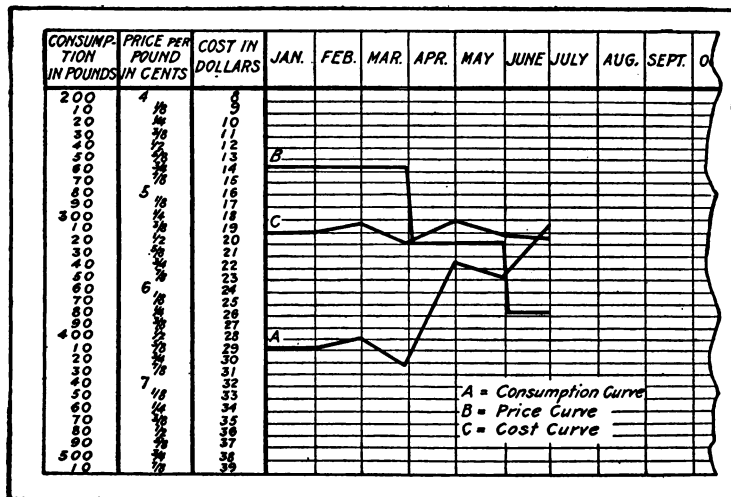
Compound Information.—The curve charts referred to are of the simplest form, but they can be added to so that they will combine additional or compound information. When such additions are made, distinctive colors should be used for each curve. The use of an excessive number of lines on a chart must be avoided; otherwise the chart will be complicated to such an extent that the very object of its preparation will be nullified.

A two-curve chart can be used to indicate both consumption and price at the same time. The correct relation between the two can then be clearly discerned, and the influence that a variation in one has on the other can be readily observed.

Three-curve charts are particularly useful in indicating consumption, price and cost. For the purpose of illustration, let us take the case of a common article, such as cotton waste. It is of advantage to use this particular example because there is a great variation in the quality of cotton waste on the market, and in connection with any such article a comparison must be kept of the results achieved by a change in substituting one quality for another. Moreover, cotton waste is very generally used, and for that reason the application of the principle it is desired to convey would appeal to a larger number than if I took as an example an article purchased by only a small proportion of buyers. It is not to be expected, however, that when the purchases of materials or supplies are very small, extensive or exhaustive data should be kept.

Let us assume that the price paid per pound did

not vary during the months of January, February and March, but that in April it was decided to buy a better quality. The price curve would immediately go upward; but if less waste were used the consumption curve would go downward. From these two curves the actual cost curve would be derived, and a graphic demonstration would be obtained of the results of the change in the buying policy. An illustration of this condition is given in Figure 33. I would suggest that every purchasing agent keep a chart like the one described. This form of triplicate chart can be applied to almost all supplies used in a plant, and is particularly valuable in keeping records of purchases of coal, lubricants, hack saws, files, and so on.



The use of three-curve charts in connection with materials used in production work requires somewhat different calculations to illustrate similar results, because any variation in production would have a greater influence on the consumption curve. It would be necessary, in this case, to add a production curve.

I have already advocated closer relations between the sales, production, and purchasing departments. Buying could be done more intelligently and more economically if estimates of future requirements were furnished to the purchasing agent as a basis upon which he could make his purchases for future delivery. This is not always done, and consequently the purchasing agent is often compelled to rely for this information entirely upon his records of past purchases. Instances have come to my notice in which sales were increased on certain articles, while nothing was done to increase the stock of raw material. If a maximum and a minimum have been agreed upon for a stipulated sales quota, then any great variation from those standards should be reflected in the quantity of raw material carried in stock.

When such provision has not been made, it has sometimes happened that requisitions were made on the purchasing agent to buy material in quantities greatly in excess of the permissible maximum. These are features which can all be provided for by the use of some form of chart or diagram which will practically enforce automatic raising or lowering of the stock limits.

Influence of Charts on Buying.—One great value to the purchasing agent of the use of charts, is that it develops keenness of vision. A few charts systematically kept over a period of sufficient length for comparative purposes, with seasons and dates, have been known to give a buyer an outlook on the future trend of prices almost uncanny in its accuracy and foresight.

When renewing contracts, or when making agreements that extend over any long period, reference to charts is the only scientific way to obtain the necessary information on which to form one's judgment. Also, in such cases, the chart can be sometimes used with good effect to influence the seller, since by it he may show that an expiring contract resulted in a loss to the buyer, and the latter may be able to gain concessions.

There is another purpose in the use of these charts: namely, to demonstrate to the buyer the wisdom of contracting over given periods for any stipulated commodity. A buyer's obligation to keep a record of values has not ceased simply because he has made a contract. He should be able to show, if called upon to do so, that the contract represented a wise expenditure. Even if the facts, when arrayed, show that the contract was not wise, but that a saving could have been effected by buying in the open market, it is nevertheless well to know this for future guidance, and it is sometimes as well for the buyer to know that his judgment is not always infallible.

Scheduling Requisitions by Charts.—Those concerns which, from force of circumstances, practise a

“hand-to-mouth” policy in purchasing, and buy in the open market, only for immediate requirements, do not have so much need for charts. But for a manufacturing plant that can make up a schedule of its requirements over a given period of time, records of prices are imperative if the most economical buying is to be done. These can be presented by the purchasing department to the manufacturing department. The latter can then make up the requisitions for quantities required, and can, moreover, make them up at the times most favorable for purchasing, as shown by the price record.

Even in those cases in which buying is done on a “hand-to-mouth” basis, a record may prove valuable, because if the record can show that saving could be effected by a different buying policy some means may be adopted for putting it into effect.

Augmenting Buyer's Knowledge of Business Conditions.—It is acknowledged that the general trend of business, and of most prices, can be forecasted by the output of the principal product of a country. As regards a country like Brazil, for instance, whose prosperity depends mainly on rubber and coffee, a chart record of these commodities would give valuable information to establishments buying or selling there. In the United States the situation is more complex, because our industries and commodities are widely diversified. At one time, the prosperity of the Southern States might have run along lines parallel with the condition of the cotton business, but for the whole country it is necessary to watch railroad earnings, building permits, bank

clearings, and many other features. However, since steel is used in so many lines of business the situation can be covered by keeping a record of the unfilled orders of the United States Steel Corporation.

Whatever may be said in favor of the use of graphic charts, this fact must not be overlooked: It is necessary first to ascertain the correct figures from our bookkeeping methods before the lines can be drawn on the chart. This does not mean that the charts are not of value—as I have said before, it is decidedly advantageous not to have to digest a mass of figures.

Economical buying is largely a result of keeping posted on market conditions, and for this reason it is desirable to know the value of graphic records portraying these and other features. Personal opinion as to the trend of business or prices is mere guesswork if it is not founded upon scientific data. It does not even deserve to be called speculation because the latter is at least based upon some fundamental basic principles.

CHAPTER XII

ROUTINE WORK OF THE PURCHASING DEPARTMENT

Disposition of Incoming Documents.—Every purchasing department receives large quantities of mail, including correspondence, quotations, acknowledgments of orders, invoices, shipping documents, catalogues, pamphlets and quite often samples, blue prints, and so on. There are also the inter-department communications, inquiries, and requisitions. All these must be taken care of in an intelligent manner. Some person in the office should be so well versed and trained in its routine and methods as to be able to segregate all the incoming mail and documents and pass them along to the various clerks interested.

There are many heads of departments who seem to think they are neglecting some important duties if they do not personally handle everything that goes

NOTE:—Acknowledgement is tendered to Otis Elevator Company, H. W. Johns-Manville Company, Warner Sugar Refining Company, and Jeffrey Manufacturing Company, for permission to reproduce the forms that appear in the following chapters. The reader should bear in mind, however, that the forms are used to illustrate the methods and means that have been found most suitable in the purchasing departments of these well-known manufacturers. While I have drawn attention to some features connected with these forms, in the following chapters I have confined the treatment to generalities, and have not specifically described the routine followed by any of the concerns named.—
THE AUTHOR.

through the department. In very small purchasing departments something may be gained by looking over all invoices, and all replies to follow up requests. In the larger departments, however, some person should be made responsible for each division, and the documents pertaining to his work should be turned directly over to him, since such a system will allow the head of the department more time for the larger affairs and for management and organization. If matters of importance do come up, in any division of the work, which need the personal attention of the purchasing agent, he should of course attend to them, but any questions regarding normal routine work should be answered by the person who has charge of that particular work.

Accumulating and Recording Information.—The routine work of actually making a purchase begins with the receipt of the requisition, but before this can be dealt with intelligently certain information must be accumulated. These things are just as essential to the proper conduct of the office work as the mechanical equipment is. It is necessary to have desks, stationery, filing cases, and other equipment, and it is equally necessary to prepare the information referred to in previous chapters if the purchasing function is to come into play after the requisition arrives in the department.

I have already discussed in previous chapters the character of the information necessary for a purchasing department, and have suggested methods for collecting and recording it. In the alignment of the work in the department and the assignment of it to

members of the staff, there are some general principles which must be adhered to. Certain classes of information must be accessible to everybody—catalogues for instance. Another class of information, such as that relating to sources of supply, is of greater moment to the person responsible for soliciting quotations than to any other member of the department. The invoice clerk, for instance, would have no use for it. On the other hand, the invoice clerk has constant use for certain price lists and trade methods of figuring extras on base prices, and these are seldom needed by others, although they may be required at times in the comparison of quotations.

For these reasons it is not possible to define a routine method for the work of collecting and recording information which would fit every purchasing department. But whenever it is feasible, it is the best plan to have a regular bureau, and to place it in charge of an intelligent, resourceful, and methodical man. In view of the nature of the work, it can be conceived that he can render service of exceptional value. The following list will give some idea of what such a man may do.

1. He should have charge of procuring, listing, assorting, filing, loaning, and securing the return of catalogues. This subject was fully treated in Chapter X.

2. He may prepare such charts and diagrams as are required by the purchasing agent. Many others will suggest themselves to him in the course of his work. Charts have been discussed in Chapter II.

3. He should have charge of all specifications, and should maintain a sufficient number of them. If standard definitions are in force, as described in Chapter II, he has charge of the purchasing department's copy.

4. He can compile and maintain a record of sources of supply, as described—with forms—in Chapter III. An additional form is given in Figure 34; this is used in the purchasing department of H. W. Johns-Manville Company. It will be noted that approval of a source of supply is given only by the general purchasing agent. The reverse side of this card has spaces, numbered to correspond with those on the front, for recording data connected with each source of supply.

SOURCES OF SUPPLY		Approval of a source of supply is only to be given by General Purchasing Agent.			
Classification		Material			
	NAME	ADDRESS	APPROVED	DATE	AUTHORITY
1					
2					
3					
18					
19					
20					
21					

FIG. 34. CARD FOR RECORDING SOURCES OF SUPPLY

This 8 by 9½-inch card, as used by the H. W. Johns-Manville Co., has space for 21 items. The reverse side is numbered to correspond with the face, and is used for recording special information.

5. Such records as it may be necessary to keep regarding quantities purchased over any given period, should also be in this man's custody. It is not always necessary for the purchasing department to compile this information from the orders placed, because it is often furnished to the department. If the reader refers to the requisition form of the Otis Elevator Company, Figure 35, he will notice that at the foot of the sheet there are spaces in which the consumption for each month of the year may be inserted. This is valuable information, because from

CHARGE TO ACCOUNT NO. CLASS	OTIS ELEVATOR COMPANY				REQ. NO. _____
					DATE _____ 191__
	PURCHASING AGENT: PLEASE ISSUE ORDER FOR THE FOLLOWING FOR DELIVERY				
	TO _____				WORKS — DEPARTMENT NO. _____
	CHARGING EACH ITEM TO ACCOUNTS INDICATED IN MARGIN				

ORIGINAL	DATE WANTED	JAN.	FEB.	MAR.	MIN.	ORDER
SHIP VIA	JULY	ASSEM. IN STOCK		NEEDED ON ORDERS		
	AUG.	STOCK MAINTAINED		MO. MIN.	MO. ORDER SHOPS	
	SEPT.	REMARKS				
	OCT.					
	NOV.					
	DEC.					
	TOTAL					
	AVE.					
	USED CURRENT					
	MO.					

SIGNED _____		DEPT. _____
APPROVED _____	APPROVED _____	FOR WORKS
FOR GENERAL WORKS MANAGER		

FIG. 35. REQUISITION FORM
 Showing method employed by the Otis Elevator Company
 of inserting consumption for each month

Material Record													
Material _____										Unit _____			
YEAR	19				19				19				
MONTH	Manville		Milwaukee		Manville		Milwaukee		Manville		Milwaukee		
January													
February													
March													
October													
November													
December													
TOTAL													

Form 428 428-4284

FIG. 36. MATERIAL CONSUMED RECORD

The figures for this record are furnished by the factories, and the record is kept in the purchasing department

it one can determine whether the consumption is greater at one season than another. The figures are inserted by the stores department before the requisition reaches the purchasing department.

In Figure 36 is shown the method pursued by the purchasing department of H. W. Johns-Manville Company for keeping a record of material. An interesting feature of this record is that it covers a period of three years, and the separate figures are given for the Manville and the Milwaukee factories. The quantities are furnished to the purchasing department by the factories, and the sheets made up from those quantities. Some interesting charts of the more important materials could be compiled from these sheets.

6. The estimate of quantities required in the future bears a close relationship to the record of quantities consumed in the past. In normal times,

<u>PRICE RECORD</u>						
MATERIAL _____					UNIT _____	
<input type="radio"/> — Delivered <input type="checkbox"/> — Not Deliv'd						
Date	Seller's No.	DESCRIPTION	Price	Discount	Terms	Authority

FIG. 37. PRICE RECORD

A distinction is made by symbol between prices for goods actually delivered and those for which only quotations are received. The sellers' names are listed on the reverse side under their key numbers

the latter may so closely approximate the former that it can be accepted, provided there are no radical manufacturing changes. If there are any, or if a new class of material is to be procured, the purchasing department should be duly advised. In any of these contingencies, with this information on record, the purchasing agent is in a position to take advantage of any favorable market, and in no case is he unaware of what the future demands will be.

7. So much has been said regarding price records in Chapter IV, on "Prices," and in Chapter VII, on "Invoices," that further discussion is scarcely necessary, but I wish to call attention to Figure 37, a form that is used by H. W. Johns-Manville Company. The

heading, "Unit," is for pound, ton, yard, and so on. The sellers are listed on the back, by number. The last column, "Authority," is for indicating from what document, or other source, the price was obtained—such as order, contract, quotation, and so on.

8. Another class of information is that relating to the physical characteristics of purchases. This can be collected and compiled from several sources. There are, for instance, the inspector's reports, which have been referred to in Chapter VI, on "Delivery." Copies of these should always come to the purchasing department. There are also the physical and chemical tests, and all the reports concerning the action of materials during the manufacturing processes, and in the form of finished product.

The outline just given includes the principal features of the information that should be secured and tabulated. Possibly in some purchasing departments other data will be found necessary; the decision in regard to this point will vary according to individual cases and circumstances. The accumulation of the data is largely a question of the enterprise and initiative of the man in charge of the work, and it is also his responsibility not to amass a lot of figures and records not pertinent to the department's work, of no value to the staff, and not conducive to the betterment of purchasing.

The Requisition.—The requisition is the tangible authorization for a purchase; it is therefore an important document. From it emanate practically all the activities associated with every order placed—in fact, it is the basis of the purchasing structure.

A realization of the importance of the requisition renders it apparent that purchasing without it must be absolutely prohibited. If this rule is made and strictly adhered to, a great deal of confusion, misunderstanding, and turmoil will be avoided. Verbal requests to buy anything should not be recognized by the purchasing department, even on trivial items. It is easy to misinterpret verbal instructions, and a mistake made in a small purchase would involve a larger proportionate loss than in a large one. If the value of the order should be only one dollar, and it was found to be a mistake, it might cost more than that amount to return the goods, get what was actually required, and make the proper adjustments. There is no visible evidence to controvert any statements which might be made in an attempt to force the purchasing department to shoulder the blame—for its own protection, verbal requests must be tabooed.

There may be occasion when some department will telephone a request to make a purchase in such cases as breakdowns, but such a request should be immediately confirmed by a formal requisition. The latter should reach the purchasing department before the order is written up and mailed to the seller, in order that, if any misunderstanding has occurred, it may be discovered and rectified before any serious consequences have resulted. A purchase may be made on receipt of a telegram from an outlying factory; but if there is any danger of a misinterpretation, a reply should be wired, specifically quoting any sizes or figures that would seem to be open to

the possibility of an error. The importance of this precaution is emphasized by an instance in which a wire was sent, requesting the purchase for immediate shipment of 5,000 feet of 300,000 circular mils stranded cable. The order was placed, and shipment made before the requisition arrived; then it was found that the order read 500,000 circular mils. The mistake was made by the telegraph company, but the case nevertheless shows the necessity of always formally confirming such requests, if errors of this kind are to be avoided.

“Rush” Requisitions.—So far as possible, “rush” requisitions should be discouraged. There are occasions, however, when material must be obtained without loss of time, even though extra expense is entailed. The need may have been created by conditions impossible to foresee, or somebody may have been negligent. Whatever the cause the need is an actuality, and must be dealt with promptly. The great danger in connection with “rush” requisitions is the abuse of the power contained in the word “rush.” There is always a tendency—which should be curbed—to mark “rush” many requisitions when the relative importance of them does not warrant their being given first consideration.

Regulations should be formulated and enforced restricting the use of such requisitions—otherwise it will be found that they will constantly increase in number. Sometimes, when the provision for “rush” requisitions is abused, the word “rush” will be written perhaps six times on a requisition, on the theory that repetition of this magic word will insure all

possible haste. The fault often lies with the clerk who writes the requisition, and may not be noticed by the person signing it. To provide against this contingency, "rush" and very urgent requisitions could be made a distinctive color—red, for instance. The urgency of the case could not then fail to be noticed by the person signing the requisition or by the purchasing department.

Fundamentals Necessary.—It is essential that all requisitions set forth certain basic facts, that they must convey information of definite value and importance. This information is the following:

1. All requisitions should be numbered.
2. They should clearly show the point of origin; that is, the department, factory, branch or other source requiring the material. While it is not imperative, still it is frequently advisable, to have a distinguishing color or letter prefixed to the number for each department; this facilitates identification, and is of great help in filing.
3. They must be signed by a properly constituted authority. It is not the province of the purchasing department to designate the persons authorized to draw requisitions, but that department should be furnished with the names of such persons.
4. Quantity, size, and weight, as may appear necessary, must be distinctly stated.
5. A complete, accurate, and definite description of the material or article required must be given. A request for four feet of sheet copper one eighth of an inch thick is indefinite and vague; yet many

such requisitions are received by the average purchasing department. All requisitions of this kind should be returned with a request for fuller information. The width, length, and gauge should be stated, as well as the temper.

6. The purpose for which the material is needed should be stated.

7. The exact, or at least the approximate, date on which delivery is required should be given. This is a vital item of information, and on this point requisitions should be explicit and frank. The woes of a purchasing department are greatest in connection with delivery. There are more complaints in regard to this matter than concerning all others combined; for the alleviation of this condition as far as possible, honesty to start with is of the greatest assistance. It is foolish, as regards delivery, to name a date ahead of requirements, and almost as bad to name one too late. Either fault will have a deterring effect on good purchasing.

Additional Information.—The features enumerated are the basic ones which are absolutely essential, but there are other points to be considered. Whenever possible, requisitions should be confined to single items, or at least to material of the same character. For instance, several items of brass tubing might appear on the same requisition, but if items for lumber, screws, and other material foreign to brass were grouped together, it would be necessary to issue a separate order for each. The purchasing department would then be put to some inconvenience in passing

one requisition back and forth among the employees, and notations would have to be made on it of each order number, name of seller, and so on, for which there might be convenient space.

It is possible that in some cases it might be advisable to state the permissible maximum and minimum, the quantity in stock, and some other details, as I shall explain in discussing the examples of requisitions which follow.

Samples of Requisitions.—Figure 35 is the form of requisition used by the Otis Elevator Company for factory purposes. The great majority of these are written up by the clerks who keep the stores physical records. When the clerk balances his inventory card, on making entries of material taken from stores, and finds that the minimum has been reached, he immediately makes out a requisition for the quantity needed to bring the amount of material to the maximum, and passes it along to the head storekeeper. The latter signs the requisition—which is in quadruplicate—and the original is forwarded at once to the purchasing department. We have to deal only with the original in connection with purchasing.

The spaces on this form for insertion of maximum, minimum, and other features are not primarily for the information of the purchasing department, although the latter gives them due consideration. Ordinarily, the amount of material in the stores and the amount requisitioned should, together, total the maximum. When this is not the case there is some reason, which is noted in the space headed “Remarks.” For example, it may be found that a pur-

chase can be effected more economically for some larger quantity which would exceed the maximum. In such an event, the general storekeeper is notified, and on his authorization the larger quantity is requisitioned. A note to this effect, reading "Maximum exceeded, for purchasing reasons," would appear in the space for "Remarks." The purchasing agent also keeps the general storekeeper advised as to the time required to obtain various materials. This information is used as an aid in determining whether the stock is to be maintained on a monthly basis, or on a two, three, or six months' basis, or even longer. Except for these features, the purchasing department has only a passing interest in the figures inserted in these spaces.

At the foot of this form, on the left-hand side, is a space for the signature of the general works manager, but his approval is required only when the requisition is for machinery, shop equipment, or something else not under control of the general storekeeper.

Figure 38 illustrates quite a different form of requisition. It is used by H. W. Johns-Manville Company in their various factories. It will be noted that it is drawn by the foreman, and that the storekeeper fills in the information as to the amount of stock on hand and the estimated time it will last.

This form is in triplicate and has a stub, which is retained by the foreman. The original is held by the purchasing department, one copy is held by the storekeeper, and the third copy (on the back of ticket "C" in the illustration) goes to the receiving de-

<small>Form DC 9-23-13-28</small> WARNER SUGAR REFINING COMPANY EDGEWATER, N. J. REFINERY REQUISITION		
REQUIRED FOR		191
CHARGE		No. A. 2793
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> DEPARTMENT REQUISITION SIGNED BY: </div> <div style="width: 45%;"> MAKE ORDER TO: </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> APPROVED: <div style="border-bottom: 1px solid black; width: 100%; margin-top: 5px;"></div> <div style="text-align: center; font-size: small; margin-top: 5px;">MANAGER</div> </div> <div style="width: 45%;"> O. K. <div style="border-bottom: 1px solid black; width: 100%; margin-top: 5px;"></div> <div style="text-align: center; font-size: small; margin-top: 5px;">PURCHASING AGENT</div> </div> </div>		

FIG. 40. REQUISITION FORM

partment. An interesting feature is ticket "C," where a complete record is kept of all material on the order.

Figure 40 is an illustration of the requisition form used by the refineries and factories of the Warner Sugar Refining Company. These requisitions are sent to the head office in New York City, where the general purchasing agent is located. It will be noted that the authorization required in this case is that of the manager of the factory or refinery where the requisition originates. At the bottom right-hand corner is a feature not shown in the preceding examples of requisitions. It is provided to enable the purchasing agent to put his O. K. on the requisition

REQ. NO. _____		
TELEPHONE PURCHASE SLIP TO BE CONFIRMED		
Date, _____ 19__		
MATERIAL _____ _____ _____		
Requested by _____	Placed by _____	With _____
Factory _____		Per _____
Price _____ F. O. B. _____ Terms _____ Deliv'y. _____		

FIG. 41. CONFIRMATORY TELEPHONE REQUISITION

after the detail work has been done on it, and before the order has been written up.

Figure 41 is a sample of a form used for an emergency purpose; I commented on it earlier in this chapter. It is not good policy to receive over the telephone these requests to purchase, and have only a vague memorandum on a hastily secured scratch pad. When messages are taken in this manner there will frequently be some omission of an essential detail, whereas if one uses a proper form on which to make a notation of the message, this cannot happen. A formal requisition follows the telephone request, and this should be marked "Confirming telephone."

In connection with all the examples given, there are matters of detail which must be settled as individual circumstances and preferences dictate. None of the seven fundamental requirements, however, as already laid down as necessary for every requisition, can be neglected. In matters of detail,

for example, the requisition shown in Figure 35 does not have any space for the order number—an unusual omission. The reason why the space is omitted is that the stenographer who writes up the order, in stamping the requisition, uses a large rubber stamp which has on it the word, “Ordered” and a space for the date and the order number. This method has one outstanding advantage—the impression of the rubber stamp, being very prominent, is clearly seen, so that requisitions already dealt with are easily distinguished from requisitions for which orders have not been written up.

Routing the Requisition.—In small purchasing departments, it is possible for all requisitions to pass through the hands of the purchasing agent himself. In larger departments, they may go over the desk of the chief clerk, who may review them. He will probably mark some of them as being of sufficient importance to be dealt with or to be brought to the attention of the purchasing agent. In still larger departments, it may be found advisable to let the requisition clerk take all requisitions first. This method would relieve the chief clerk of much detail work, as many of the requisitions could be disposed of without going through his hands. Those for material for which there is a blanket contract, or for which a price has been established, could be passed along for the order to be written up. It is taken for granted, of course, that all features of the requisition are in proper order, that material is correctly specified, and that the requisition is signed by some authorized person.

The paying teller of a bank would not cash a check until he had noticed the date, assured himself that the signature was genuine, and made sure that the amount demanded stood to the credit of the drawer on the books of the bank. A requisition has some features which are analagous to those of a check, and these features require examination. For example, the requisition clerk must see that the requisition is signed by some person who has the necessary authority. He should see that it bears the date upon which it was drawn; or, what is more essential, the date of its appearance in the purchasing department should be stamped on it. The specification of the material or article must be closely scrutinized and, if not correct, it must be made to conform to the standard practice as explained in Chapter II. The date on which delivery is required should be definitely stated. It is not sufficient to say "soon," "quickly," or "as soon as possible." These expressions, used in this connection, have no real definite meaning, whereas, as previously stated, one of the most important features of a requisition is the honest statement of a delivery date. If a requisition fails to meet any of the tests to which it is subjected, it should be returned to the maker for correction.

Pricing Requisitions.—Having satisfactorily passed the tests, the requisition should be priced. It is possible that the material which it covers has already been contracted for—if so, all that is then necessary is to insert the contract price, delivery point, and a notation to the effect that the order is issued "On account of contract dated——"

In those cases in which competitive prices have to be obtained, a form suitable for the purpose should be used. Figures 42 and 43 illustrate quite different styles of forms for requesting quotations. These will serve as a basis for a similar form for any industrial establishment. Care should be exercised in the wording of these forms, to prevent their being mistaken for orders. These inquiries for prices are sent to the selected sources of supply, as fully discussed in Chapter II. If the material is correctly and

OTIS ELEVATOR COMPANY OFFICE OF PURCHASING AGENT		Request for Quotation
_____ . Please quote ON THIS SHEET your best price F.O.B. _____ for the articles specified below and state how soon you can furnish the same. Bid on each item separately. DO NOT FAIL TO SIGN THIS BID		
Total		
Signature _____ Address _____		Requisition No. _____ Purchase Order No. _____

FIG. 42. REQUEST FOR QUOTATION

The paper for this form is very thin so that a number of copies may be made


	H. W. JOHNS-MANVILLE CO. MADISON AVE. & 41st STREET NEW YORK CITY	INQUIRY NO. Date
Empty space for drawing or notes		
<p>Please quote the following material F. O. B. _____</p> <p style="margin-left: 40px;"> { State when you can ship. { State terms of payment. </p> <p style="margin-left: 40px;">Material is required at destination before _____</p> <p style="margin-left: 40px;">This is <u>not</u> an order.</p>		
Direct reply to H. W. JOHNS-MANVILLE CO. PURCHASING DEPARTMENT Madison Ave. & 41st Street NEW YORK Attention of _____		

FIG. 43. REQUEST FOR QUOTATION

adequately specified, replies are usually received very promptly; upon receipt, they will have to be tabulated for comparative purposes. It is possible to have the back of the requisition arranged for the tabulation and comparison of prices. Such an arrangement renders unnecessary the use of a special form, and whenever it is found necessary to look up the quotations received on any requisition, the search is greatly simplified if it is possible to refer to the requisition itself. However, this is not always possible—a special form for quotation purposes is illustrated in Figure 44. This is a very useful form; in

COMPETITION SHEET						
Material		Last Purchase				
Date		Date				
BIDDER					F. O. B.	TERMS

FIG. 44. FORM FOR TABULATING QUOTATIONS

those cases in which the price clerk has not the authority to decide on the acceptance of any bid, it furnishes a brief, clear and concise method of presenting the quotations to the purchasing agent or chief clerk for decision. It makes it unnecessary for either of these persons to wade through each quotation. All bids should be read very carefully, since it is a very common occurrence for the prices to be made on a basis different from that indicated in the quotation request. This is particularly noticeable in connection with the delivery point. Very frequently these quotation forms come back with prices named at varying f. o. b. points, even though the requests all named a uniform specific point of delivery. In these cases, the freight from f. o. b. point to destination would have a bearing on the quotations.

When a purchase is made locally, the prices can be obtained by telephone and written on the back of the requisition, but it is imperative that the bidders should be made to understand clearly what is being inquired for, and that the name of the party quoting the price be ascertained and noted. A memorandum should always be made on the requisition stating the accepted price and the fact that the order is in accordance with the quotation made by telephone by Mr. ——— on ———. If the order is placed by telephone, or verbally with a salesman, a memorandum should be made to that effect, so that when the order is written up it can be marked "Confirming telephone order" or "Confirming verbal order given to your Mr. ——— today."

These points are important. They might seem trivial to the casual reader, but in an experience in which it was necessary to telephone an average of fifty to sixty orders every day it was found that they were vital. Much confusion resulted either if the price or the "Confirming telephone order," etc., was omitted by the price clerk, or if these were overlooked by the clerk when he wrote up the order. There is the possibility that goods may be shipped out of the warehouse by the seller immediately after the receipt of the telephone order, and that then on receipt of the formal order an additional shipment may be made duplicating the first one. Only a rigid adherence to the rules laid down can prevent such an occurrence. When the work on a requisition is finished, it is passed along to the order clerk in order that the formal order may be written up. Before

leaving this subject, however, I wish to treat the disposition and filing of the requisitions.

It will have been gathered from what has already been said that there is no standard type of requisition with respect to either size or wording. For the great majority of industrial establishments the most useful size is probably about 8½ inches square. The ideal requisition should be arranged with spaces for the insertion of the following:

Checked by.....Priced by.....
Price obtained from contract.....
“ “ “ quotation.....
F. O. B.....
Order from.....Order No.....

When these spaces have been used for their indicated purposes as the requisition has passed along to be finally disposed of, and when the requisition finally completes its journey through the department, there is a clean-cut, complete document telling a concise and intelligent story. There is no reason why proper places should not be provided for the particulars indicated. To make the notations in various places on the requisitions is a ragged, loose method, and much confusion will result if reference has to be made at any future time to the document.

Every requisition should be numbered, and for purposes of identification the order number must also be inserted on the requisition, and the requisition number on the order. These numbers connect them in such a way that reference from one to the other is quick and certain. Because of the importance of

the requisitions, they must be preserved for such periods as may be found necessary in each individual case. The best scheme is undoubtedly to use post binders, retaining the system of numerical sequence in filing. Many thousands can be kept by this method, economically and in a very limited space; the requisitions are easy of access and cannot be misplaced. There are a few departments that use the vertical filing system; in these cases the purchasing department's copy is made of fairly heavy stock in order that it may stand the use to which it is put. Requisitions should be numbered when printed. The spacing should be arranged to conform to typewriter spacing, and all copies should register.

In conclusion it is worth while to emphasize the fact that every purchase should be sanctioned by a requisition. In the case of verbal or telephone requests to purchase, requisitions should always be exacted. Verbal requests to purchase should be sanctioned as seldom as possible. If conditions and circumstances do not warrant them, the purchasing agent should take a determined stand in the matter and refuse to honor them.

CHAPTER XIII

ADDITIONAL ROUTINE WORK OF THE PURCHASING DEPARTMENT

Contracts.—Before discussing the routine work connected with the order, which follows in logical sequence after the requisition, I wish to discuss the subject of contracts, since many orders apply on contracts which may be in force.

Practically all industrial establishments of any magnitude find it essential to cover part or all of their requirements of certain materials with blanket contracts. These have been discussed in Chapter V—they are, in effect, somewhat similar to a bank account. Every time an order is made out to apply on a contract, the proceeding can be compared to drawing a check against an account. Contracts of this nature are really arrangements made in advance of the actual need of the material. Although it may be definitely agreed to take a specific quantity in a given time, the actual need and instructions to forward are represented by the order, which follows on the receipt of the requisition.

Contracts are entered into by the purchasing agent with the known requirements of the factory as a basis. The selection of the materials or supplies which it is thought advisable to place contracts for, is entirely within the jurisdiction of the purchasing

agent, although any action he may take will probably be subject to the approval of the directors or executives. It is customary for the purchasing agent to conduct personally the negotiations in connection with these contracts, using his knowledge of business conditions, markets, prices, available sources of supply, and all other factors which have previously been discussed.

There are many forms of these contracts—one of them was given in Chapter V, Figure 15. Another is given here, Figure 45. In connection with this it will, of course, be appreciated that there are some stipulations in such a contract which cannot always be enforced, particularly in strenuous times, when the sellers have the upper hand to a large extent. In ordinary times it is very useful, and is generally accepted by the sellers; it has been found a workable form of contract by some of the largest industrial establishments. Like all other contracts, it must be administered in a spirit of fairness and mutual confidence. Provided this spirit forms a basis for the relations between the buyer and the seller, there is nothing agreed to in this form of contract that cannot be performed.

CONTRACT

between the SMITH-JONES MFG. CO., (the Purchaser) and.....

 the (Seller) for furnishing.....
 for a period of.....months,
 commencing

Material:

Material shall be.....
.....
.....

Quantity:

Quantity shall be the entire requirements of the Purchaser at its factor.... now, and for some time, in operation..... located at.....
.....
or at any other point where the Purchaser may require the material for its own uses.

Quality:

The quality of the material shall be.....
.....
.....
and must be satisfactory to the Purchaser. If, at any time, material furnished is not satisfactory to the Purchaser, and the Seller, upon due notice in writing does not forthwith make the same satisfactory, the Purchaser shall have the right to terminate the entire contract, if it so elects. The Purchaser shall have the right to return all unsatisfactory goods for credit, at the expense of the Seller. Such credit shall be in cash or goods covered by this contract, at the option of the Purchaser.

Price:

The price shall be.....
.....
.....

Delivery:

Delivery at the above price shall be made F. O. B.
.....

Deliveries shall be made at such times and at such places as the Purchaser may designate by formal orders. If the Seller does not make deliveries with reasonable promptness the rights of the Purchaser shall not be forfeited by making purchases elsewhere.

Terms:

Terms of payment shall be.....

Routing:

The Purchaser shall have the right to route all shipments, provided however, that such routing on material sold at delivered prices shall not increase the cost of delivery.

Packages:

Material sold by weight shall be charged at net weight not including weight of packages. No charge for package, container, cartage or otherwise, shall be made unless specifically herein agreed.

Renewal:

The Purchaser has the right to renew this contract for a like period of time at the same prices and terms.

Patents:

The Seller agrees to defend at his sole cost and expense any suits brought against the Purchaser for alleged infringement of letters patent by reason of use or sale of goods covered by this contract, and to make good to Purchaser any damages, costs or money recoveries resulting from such suits.

General:

This contract is subject to strikes, fires, accidents or any cause for delay beyond the control of the Purchaser or Seller.

DATE.....

Accepted:

Accepted:

SMITH-JONES MFG. CO.,

.....

FIG. 45. FORM OF CONTRACT FOR INDUSTRIAL PURCHASES

CONTRACT RECORD												
	CONTRACTOR MATERIAL DATE EXPIRES QUANTITY PRICE											
	SHIPMENTS											
	Date		QUANTITY UNIT		VALUE		Date		QUANTITY UNIT		VALUE	

FIG. 46. RECORD OF SHIPMENTS AND PROGRESS IN FILLING ORDERS

As stated in the delivery clause of the contract, Figure 45, formal orders will be issued from time to time as the material is required. But as these orders are scattered through the binders, in regular numerical sequence, with orders for other materials and supplies, it is necessary to keep a record of the shipments made against the contract. This requirement is provided for by the form shown in Figure 46. It is important to keep an accurate record of these shipments; they should be posted on the contract record, from the invoices and not from the

orders. The reason is that the full quantity ordered may not be shipped, and in a constantly advancing market the buyer might be short of a very large quantity. Where these conditions prevail, pressure must be exerted to obtain the contract quantity.

Orders.—The order form is the most important document used by the purchasing department. It is a legally binding obligation on the buyer if it is issued in acceptance of a quotation, or if it is issued as an offer to buy and is accepted by the seller. While it is unnecessary to employ intricate legal phraseology in the text of an order, nevertheless there are certain technicalities which must be complied with, and which arise in the ordinary transaction of the business.

Some manufacturers attach greater importance than others to the insertion of all clauses covering the various conditions. This will appear from the illustrations that follow. Some also require acknowledgments, while others will waive these. The cardinal points that must appear on every order have been discussed in Chapter V, but the routine work of the purchasing department may include some other features. For example, if invoices in duplicate or triplicate are required, the fact should be stated on the order. Some sellers are very tardy in sending in invoices, and as promptness in this respect is essential to the efficient working of the purchasing department, as well as to the cost, auditing and financial departments, something might be included regarding this point. These and similar matters must be left, however, to individual decision.

Acknowledgment of Orders.—In regard to acknowledgments of orders, these are difficult to get in every case. Nearly all attempts—no matter what the method—to secure acknowledgments are treated in a perfunctory manner by the sellers. One scheme, as illustrated in Figure 47, is to have a perforated slip attached to the order, to be signed by the recipient and returned to the buyer. This order form is a splendid example of a very complete and well-framed order. Mr. J. R. Pels, purchasing agent of the Warner Sugar Refinery Company, expresses himself as follows on this subject:

I have given the conditions printed on the reverse side of this order much attention, and find them very useful. I am very particular about having the perforated acceptance slips returned, signed in such a manner as to make the signature binding in law, and I have found at times that this acceptance of the order has saved us a great deal of annoyance, and considerable money in some instances.

Other schemes for getting acknowledgments are to send separate acceptance forms, or to send postcards with the orders, but probably these receive less attention than the perforated slips. A good scheme is to send the order to the seller in duplicate; the two copies are identical, except that the one to be signed by the seller and returned to the buyer bears this clause, "Receipt is acknowledged of this order and the conditions are accepted by us. Signed——"

Generally speaking, acknowledgments are not of such great moment in connection with orders issued on account of contracts, or for orders issued in acceptance of a written quotation from the seller. In the former

WARNER SUGAR REFINING COMPANY PURCHASING DEPARTMENT		
79 WALL STREET NEW YORK CITY		
PURCHASE ORDER NO. B 6025		
M. _____		
PHONE 8600 HANOVER		
PLEASE FURNISH THE FOLLOWING MATERIAL CONSIDERED TO ESTIMATION GIVEN BELOW, IN ACCORDANCE WITH CONDITIONS GIVEN ON EACH ORDER OF THIS ORDER, SENDING ORIGINAL BILL FOR EACH SHIPMENT, SEND BILLING THEREOF FOR EACH SHIPMENT. NOTE ORDER NUMBER ON EACH BILL.		
QUANTITY	ARTICLE	PRICE
<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto; text-align: center; line-height: 100px;"> CORRECT </div>		

CONDITIONS

QUALITY. ALL MATERIALS PURCHASED MUST BE THE BEST OF THEIR RESPECTIVE KINDS AND WILL BE SUBJECT TO OUR INSPECTION AND APPROVAL AS TO QUALITY. MATERIALS NOT APPROVED WILL BE REJECTED AND REWORKED AT THE PURCHASER'S EXPENSE. IF THE PURCHASER'S INSPECTION REVEALS DEFECTS, THEY WILL BE HELD FOR INSPECTION AT TWO RIM AND EXTREME.

QUANTITY. THE QUANTITY OF MATERIAL MUST NOT BE EXCEEDED WITHOUT OUR PREVIOUS WRITTEN PERMISSION.

DELIVERY. DELIVERY MUST BE MADE AS SPECIFIED IN THE BILL OF LADING. THE PURCHASER MUST BE READY TO RECEIVE THE MATERIAL AT THE TIME AND PLACE SPECIFIED. FAILURE TO DO SO WILL BE CONSIDERED AS A BREACH OF CONTRACT. THE PURCHASER WILL BE RESPONSIBLE FOR ALL CHARGES AND COSTS OF DELIVERY.

ROUTING. ALL MATERIAL MUST BE FORWARDED BY THE PARTICULAR ROUTE NAMED. THE PURCHASER MUST BE RESPONSIBLE FOR ALL CHARGES AND COSTS OF DELIVERY. THE PURCHASER WILL BE RESPONSIBLE FOR ALL CHARGES AND COSTS OF DELIVERY.

BILLS. ITEMIZED BILL GIVING THE CORRECT PURCHASE ORDER NUMBER, QUANTITY, KIND OF MATERIAL, AND DATE OF DELIVERY. THE BILL MUST BE ACCOMPANIED BY A COPY OF THE MANIFEST AND BILL OF LADING. OTHERWISE WE CANNOT PREVENT DELAYS IN PAYMENT OF YOUR ACCOUNT.

DRAFTS. NO DRAFT FOR PURCHASES MADE BY THIS COMPANY WILL BE HONORED.

CARTAGE. NO CHARGE WILL BE ALLOWED FOR CARTAGE OR PACKING UNLESS BY SPECIAL AGREEMENT.

STATEMENT. SEND STATEMENT OF ACCOUNT THE FIRST OF EACH MONTH.

NOTICES. A NOTICE MUST BE SENT TO US AS SOON AS MATERIAL HAS BEEN RECEIVED. THE NOTICE MUST GIVE THE PURCHASE ORDER NUMBER, KIND OF MATERIAL, SHIPPERS' NAME, CAR NUMBER AND INITIALS, AND ROUTE BY WHICH FORWARDED.

DISCOUNT. SEND CAR INVOICE OF INVOICE.

FIG. 47. ORDER FORM WITH PERFORATED SLIP FOR ACKNOWLEDGMENT
 Conditions, shown at the right, are printed on the reverse side

case, the contract is closed, and the order is really a form of delivery instructions. In the latter, the order completes the contract. The main advantage in obtaining an acknowledgment in these instances, is to secure an assurance from the seller that he actually received the order. Acknowledgments are very essential when orders are issued for material for which there has been no previous offer to sell. Because there has been no "meeting of minds," there is no agreement and consequently no contract. As I have already explained, the order is simply an offer to buy, and to complete the agreement an acceptance from the seller is necessary.

Figures 48 and 49 are also excellent examples of purchase orders. The former has conditions printed on the reverse side, while the latter has some conditions printed at the foot, with a blank space sufficient for the insertion of any special conditions that might be necessary with certain orders. All these orders are in triplicate or quadruplicate. In the progress of the discussion of routine work, these copies will come in for consideration.

Writing Up Orders.—In the last chapter I explained the active work of the requisition. It has also a negative duty to perform, for from it the order must be written up. The digression which has taken place from the end of the last chapter to the present point has been essential to the explanation of some of the features connected with contracts and orders. I shall now consider the requisition in its completed state, and continue with the progress of the routine work. The order clerk has only to transcribe cor-


Purchasing Department		REVERSE SIDE OF TRIPPLICATE SHOWING ORDER NO.				
H. W. JOHNS-MANVILLE CO.						
Madison Ave. & 41st St., NEW YORK, N. Y.						
TO	DATE	ORDER NO.				
		REQ. NO.				
		MARK				
SHIP TO		VIA				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">QUANTITY</th> <th style="width: 70%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="height: 100px; vertical-align: top;"> <div style="text-align: right; padding-right: 20px;"> H. W. JOHNS-MANVILLE CO. F. W. ROWE, General Purchasing Agent </div> </td> </tr> </tbody> </table>			QUANTITY	DESCRIPTION	<div style="text-align: right; padding-right: 20px;"> H. W. JOHNS-MANVILLE CO. F. W. ROWE, General Purchasing Agent </div>	
QUANTITY	DESCRIPTION					
<div style="text-align: right; padding-right: 20px;"> H. W. JOHNS-MANVILLE CO. F. W. ROWE, General Purchasing Agent </div>						
<small>Form 1000 12-1-20-25</small>						
THIS CONTRACT SUBJECT TO CONDITIONS PRINTED ON BACK HEREOF						
CONDITIONS						
GUARANTEE All articles and materials furnished on this order guaranteed to be satisfactory to us in every respect, otherwise held subject to your order.						
ROUTE Unless otherwise specified, ship by freight unless express charges are approximately the same.						
MARKINGS Purchase order number must be shown on all packages or shipment will not be accepted.						
SHIPMENT Shipment must actually be effected within the time stated on Purchase Order, failing in which we reserve to ourselves, the right to purchase elsewhere and charge you with any loss incurred thereon, unless deferred shipment be arranged for in writing. Orders subject to cancellation in case of strikes, fire or conditions beyond our control or affecting our operations. All materials purchased on weight basis, unless otherwise arranged for, will be settled for at net weight, not including weight of package or container.						
INVOICES Render invoices in triplicate on date of shipment, and separate invoice for each order. Note shipping weight on invoice and accompany by bill of lading, showing freight rate. Purchase order number must appear on invoice.						
DRAFTS No drafts for purchases made by this company will be honored.						
PACKING AND CARTAGE No charges will be allowed for packing, boxing or cartage unless agreed upon in writing at the time of purchase, but damages to any material not packed to insure proper protection to same will be charged to you.						
PAYMENTS If an invoice is returned and subject to cash discount same will be discounted 10 days from receipt of correct invoice. If above instructions are not complied with, invoices cannot be passed for payment. Unless otherwise arranged we will consider invoices for these goods payable on the 10th of the month following receipt of material, deducting 2 per cent. cash discount at that time per 60 days net. This company pays all net bills falling due in any month prior to the 12th of such month. Invoices received after the 2nd of any month will be treated as invoices of such month. Order given subject to above conditions. Unless invoices are mailed on shipping date, the discount period will be calculated from date of receipt of same. We reserve the right to adjust any irregularities against subsequent shipments.						
RAGS Rags and all material purchased on this order are guaranteed by shipper to be dry and free from rubbish or any materials unsuited for making paper or felt, and, when received, are subject to mill report as to weight and grading. Rags and all material containing moisture or trash will be, at our option, subject to rejection, or, if such stock is accepted, it will be at a deduction for outthrows and moisture, plus the freight on the outthrows and moisture, with an additional 2c per pound reduction on actual weight of outthrows sorted, to cover expense incurred in sorting. All waste material and outthrows to be disposed of by us. Your acceptance of our order constitutes agreement to above terms.						

FIG. 48. ORDER FORM AND ACCOMPANYING CONDITIONS
The conditions shown below are printed on the reverse side.
280

Form 548

THE JEFFREY MFG. CO.
PURCHASE AND STORES
DEPARTMENT

Note This Number on Invoices
and Packages.

ORDER No. D 33319 COLUMBUS, OHIO.

SHIP TO

VIA

MAIL ALL CORRESPONDENCE, INVOICES AND SHIPPING DOCUMENTS PERTAINING TO THIS ORDER, TO
PURCHASING DEPARTMENT,
THE JEFFREY MANUFACTURING CO.
COLUMBUS, OHIO.

IF NOT OTHERWISE ORDERED, SHIP ALL GOODS BY FREIGHT, UNLESS EXPRESS CHARGES ARE APPROXIMATELY THE SAME.
CHARGES FOR BOXING WILL NOT BE ALLOWED.
ON MATERIAL SOLD F. O. B. COLUMBUS, TRANSPORTATION CHARGES MUST BE PAID.
PURCHASE NUMBER MUST APPEAR ON INVOICES AND PACKAGES.

Noel
Purchasing Agent.

RENDER DUPLICATE INVOICE WITH PRICES

FIG. 49. ORDER FORM WITH SPACE FOR ADDITIONAL CONDITIONS rectly to the order form the particulars on the requisition. Every order should be checked before mailing, and in the case of those of any consequence it is particularly important that this checking never be omitted. It is absolutely imperative to check these orders for which acknowledgments are demanded. It will be observed that in the form shown in Figure 47 a space is provided for the initials of the person who checks the order. The order clerk should be responsible for the proper distribution of the copies, and should have charge of the purchasing department's copy until it is taken over by the follow-up clerk.

It is generally the practice to keep the copy of orders in the purchasing department in a post binder. This scheme is used by the Otis Elevator Company—actually 100,000 copies are kept with a minimum of trouble in the smallest possible space, and they are so easy to refer to that it is no more difficult to find a copy than it is to find a given page in the Encyclopedia Britannica if one has all the volumes in front of him. Mr. F. W. Rowe, general purchasing agent of H. W. Johns-Manville Company, says, in connection with the purchasing department's copy of their orders: "Although this is a loose-leaf form, we have recently found it just as safe to handle these as to handle cards in an open index file or tray."

It is sometimes necessary to make changes in an order after it has been sent to the seller—most often in connection with delivery dates. Written instructions on such points must be sent to the seller. An excellent plan for taking care of this feature is illustrated in Figure 50; it has so many advantages over writing a letter that it should be universally adopted. The form, termed an instruction sheet, is identical, in size and spacing, to the order form. A copy is kept in the purchasing department, and is filed with the copy of the order, to which it can be fastened if necessary. Since it is of a distinctive color, it cannot escape observation when in the file. If a letter is written, additional work is involved in making a notation on the copy of the order, and this notation may sometimes be overlooked. Moreover, the copy of the letter gets into the general file, and a record of the change in the order is lost.

TO	INSTRUCTION SHEET H. W. JOHNS-MANVILLE CO. Madison Ave. & 41st Street, NEW YORK	APPLIES TO ORDER No. REQ. No. DATED
<div style="border: 1px solid black; border-radius: 15px; height: 60px; margin: 10px auto; width: 80%;"></div> <p>PLEASE OBSERVE THE FOLLOWING INSTRUCTIONS APPLYING TO OUR ABOVE ORDER</p>		
THIS CANCELS ANY PREVIOUS INSTRUCTIONS ISSUED ON THIS ORDER H. W. JOHNS-MANVILLE CO. PURCHASING DEPT. PER...		

FIG. 50. INSTRUCTION SHEET

This form, as noted, pertains only to orders bearing the same number.

In some establishments there is a rule—usually made for financial or auditing reasons—to the effect that the copy of the order kept in the purchasing department must bear the price of the material or the article ordered. It may not always be possible to insert the price before the order leaves the office, since the seller may be located at some distant point. In such an event, it would take several days to secure a quotation, and valuable time be lost if it should be necessary to get the order placed quickly. Under circumstances of this kind a letter can be written giving the particulars of requirements, with instructions to proceed, and asking the seller to state the price. When the latter has done this, a formal order may be issued. However, many sellers will not proceed without a formal order, and so it is better to send the formal order and request that a statement of the

price be sent by return mail. Some firms use a form for this purpose if they issue many such orders; an illustration of such a form is shown in Figure 51.

Variations in Routine Work.—For the sake of outlining a well-defined route for the work of a purchasing department, I have assumed that the progress of that work depends on a succession of individuals whose duty it is to handle certain developments as the work is carried to completion. It is literally true that the purchasing activities must follow a well-defined course, and that there is a logical rotation for them, but it is not true that there must be a corresponding succession of individuals each of whom would handle a different activity or function.

In some purchasing departments there are several men engaged in obtaining prices and telephoning orders, and each of them writes up his own orders. In other departments the requisitions are divided up among several men, who verify them, insert prices, make the necessary notations on them, and pass them along to boys or girls, who write them up. In either of these cases the orders are collected as fast as they are written by a clerk, who puts them through the final checking and filing stages already described. Whatever changes there are in the personal element in handling the work, there must not be any deviation from the fixed stages through which the purchasing function should proceed step by step.

Purchase Order Record.—As fast as the orders are written up—and before they are filed, or immediately afterwards—a record of them must be made. This record is in the nature of an index of material. An

THE J. G. WHITE ENGINEERING CORPORATION
ENGINEERS CONTRACTORS
43 EXCHANGE PLACE.
NEW YORK

_____19

GENTLEMEN:

ORDER No. _____ CONTRACT _____

Please refer to our order of the above number and place hereon, in space allotted below, your very best quotation covering the items included in the order.

Yours very truly,

THE J. G. WHITE ENGINEERING CORPORATION
E. N. CHILSON
MANAGER OF PURCHASES

By _____

THE J. G. WHITE ENGINEERING CORPORATION

GENTLEMEN:

We quote below our very best prices covering the items mentioned on your order of the above number.

<u>Item No.</u>	<u>Unit Price</u>	<u>Total Price</u>

•

Yours very truly,

FIG. 51. REQUEST FOR PRICE ON ORDER ALREADY ISSUED

[illegible]

make one of them the most prominent feature, the form can be readily rearranged—as a matter of fact it can be made to conform to practically any condition.

Delivery Problems.—When material has been purchased, an order placed for it, and a satisfactory delivery date set, it would seem that the purchasing department has practically completed the work connected with the transaction. This is far from being the case, for if the matter were allowed to remain in a quiescent state when it had reached this stage, every advantage stipulated in the contract might be lost to the buyer. Getting quotations and getting sellers to accept orders is relatively easy work compared to getting them to make deliveries at certain promised dates.

There are probably a few purchasing departments free from any serious delivery problems, but generally speaking, delivery is the phase of purchasing in which it is most difficult to get satisfactory results. Complaints against the purchasing department occur more frequently on account of delivery questions than from all other causes combined.

Following Up Orders.—It is highly important that every order be “followed up.” This means that the intent and purpose of the order must be followed to their logical conclusion, the contract must be completed by the delivery of the goods, and payment must be made for them. There are innumerable schemes for taking care of this work, and each of these is probably somewhat different from the others in detail and application. With each and all of

them, however, the largest factor of success is consistent, persistent, and unremitting attention.

For the purposes of the present discussion, every order can be placed in one of three classes:

1. Orders on which no delivery has been made, and on which no invoice has been received.
2. Orders on which delivery has been made, but on which no invoice has been received.
3. Completed orders, on which delivery has been completed and invoice received.

The question at once arises as to the manner of separating the orders to preserve these classifications. This depends largely on the follow-up system adopted, as well as upon the number of orders. If there are only a limited number, say a quantity not exceeding an average of twenty-five orders a day, it is quite possible to keep the first two classes in temporary binders, and to transfer them to the permanent file when the desired object has been attained. This is all the more feasible if many of these should be orders for immediate delivery, for then they would be sure to be quickly disposed of. On the other hand, if the orders are in excess of the quantity named, and if many of them are for deferred delivery, an extra copy of the order must be made and must remain in possession of the person in charge of getting delivery, until his work is completed. Then, if the invoice is not received, it will pass along to the invoice clerk.

The latter scheme—which involves the making of an extra copy of the order—is necessary because if there is only one copy in the department, and it is

held out of the permanent file until delivery is completed and all invoices rendered, the number so held out would reach such large proportions that the work of later transferring them to the permanent file in proper numerical sequence would be a serious problem. The records of delivery and invoices, however, must appear on the copy in the permanent file. Therefore, it is necessary when delivery is made to make this record on such copy. The temporary copy can receive a check mark of some description, indicating that this has been done, and it then will pass to the invoice clerk.

The advantages of segregating the copies to preserve the threefold classification, are the following:

1. The permanent file of copies of orders, which are usually of thin stock, are subject to less handling and are preserved intact. These copies have a permanent location in the department, and can always be referred to by any member of the staff, at any time, without interference with the work of the follow-up and invoice clerks.

2. The clerk in charge of delivery always has at hand, for his own particular use, copies of all orders he is interested in. This advantage is valuable because he is not obliged to refer to the permanent file, which may be located at some distance from his desk, and at the time he needed one of the binders another member of the department might be using it. Or, should he not have these copies, he might have to transcribe in longhand onto cards the details of each order he had to follow up.

3. The invoice clerk always has a complete file of those orders against which invoices have not been received. Many purchasing departments are lax in this respect, paying little or no attention to the receipt of invoices. If the invoices come in, "well and good." If they never come in, still it is "well and good." Since the purchasing cycle is not complete without the invoice, its prompt delivery should be insisted upon. Under this scheme, also, it is possible to give a prompt answer to the financial department should a request be made for a statement as to the value of material ordered but not invoiced.

The routine of follow-up work really begins at the time the order is mailed to the seller; therefore, if acknowledgments are to be secured, they come within this category. In some purchasing departments, a great many city orders are telephoned to the sellers. Delivery of some of these is effected before the formal confirmation is mailed. In all such cases, the orders pass immediately into the second class. There are also a great many orders which call for immediate shipment; if delivery is made at once, these orders would also pass into the second class. In both cases cited, the invoices should be received promptly; when they are received, the orders are automatically transferred to the last class.

In any scheme for getting acknowledgments and delivery, the copy of the order should be used for recording any action taken and promises made, because thus the complete story is kept together. If these records are kept on separate cards or sheets,

FOLLOW-UP		GOODS RECEIVED			INVOICES			
Date	Action taken	Date	Quantity	Rec'g Slip	No.	Date	Quantity	Amount

FIG. 53. REVERSE OF ORDER-SHEET RETAINED BY THE PURCHASING DEPARTMENT

Showing the scheme for recording follow-up work, receipt of material, and invoice work

a lot of unnecessary work is entailed in transferring the particulars of the order to the card. Or, if this is not done, then it is constantly necessary to refer to the order for particulars concerning the material, dates, and so on. Paper of different colors should be used for all copies of orders—then it will be impossible for them to get into the wrong channels.

The copies of orders retained in the purchasing department should be printed on the reverse side as illustrated in Figure 53. The question arises as to the manner of dealing with these copies. When only a small number of orders have to be followed up, the copies can all be looked over daily, and

those which need attention can be selected. If it is not necessary to keep them in numerical order, they can be arranged in pigeon holes, one for each day of the month. But the more numerous the orders, the more essential is it to keep them in numerical sequence. When they are kept in this way, a card for each day of the month can be filed, and on the cards only the order numbers need be noted. Each day's card would then indicate those orders which needed attention on that day.

There is one big advantage in securing an acknowledgment from the recipient of an order—the acknowledgment usually contains the seller's promise of delivery, and this is something tangible with which to start the follow-up work. Many orders are sent out with a delivery date specified, but this is often the date set by the buyer as indicating when he requires the material, and is not based on any promise from the seller.

As explained previously, the great difficulty encountered in this work is that of obtaining satisfactory replies or, sometimes, replies of any kind from the shippers, but they can be secured through persistent effort. It will pay to use discrimination—to ask for information only when absolutely necessary, and to refrain from making unimportant inquiries will help materially. Shippers will quickly respond to such consideration. A large number of indiscriminate inquiries would only tend to make the shippers resent the uncalled for importunities of the buyer, and eventually the former would simply become indifferent and refuse to pay any attention at all.

The form and manner in which the inquiry is made will have a large influence in determining its measure of success. All city and local inquiries can be made by telephone, and the record of them can be placed on the order at the time the message is received. The inquiries which it may be necessary to mail, if couched in brief but courteous language, will bring better results than if abruptly expressed. The principal point is to get a reply. A form used with considerable success is illustrated in Figure 54—it has been found that a very small percentage of inquiries of this type have failed to bring replies. In more important and urgent cases it is desirable to follow the first inquiry with some such form letter as the one illustrated in Figure 55. The percentage of these follow-ups that have failed to bring answers is so small as to be almost negligible, and if they, in turn, were followed by a specially worded personal letter, results could always be secured. The success of all efforts of this character depends on the insistence on getting replies, properly recording the information, and pursuing the matter at the exact time it is necessary to get information.

So far the discussion connected with the following up of orders has been confined to the matter of getting promises, but promises are intangible things at best. A satisfactory conclusion and the final disposition of the problem is secured only when the evidence of shipment is received. The bill of lading, shipping notice, or other document, should pass through the hands of the follow-up clerk, should be recorded on the copy of the order, and then should

FORM 654 (REV. 5-3-16)	
FOLLOW UP ON MATERIAL ORDERS	
TO _____	DATE _____
PLEASE ADVISE BELOW WHEN YOU WILL SHIP MATERIAL SPECIFIED ON OUR ORDER DATE _____	{ OUR NO. _____ YOUR NO. _____ SHOP NO. _____
OTIS ELEVATOR COMPANY	
_____ OFFICE	
REPLY (DO NOT DETACH FROM ABOVE)	
DATE _____	
THE ABOVE ORDER _____	SHIPPED _____
FROM _____	VIA _____
REMARKS: _____	
SIGNED _____	

FIG. 54. FORM USED FOR FOLLOWING UP ORDERS

be passed along to the receiving department or the traffic department, as conditions demand.

Another phase of the work connected with delivery has to do with inspection made at seller's factory or point of shipment. This matter has been discussed in detail in Chapter VI. On receipt of the inspector's report, a notation regarding it should be made on the copy of the order, as should also reports from special

OTIS ELEVATOR COMPANY

NEW YORK

PURCHASING
DEPARTMENT,ELEVENTH AVENUE
AND TWENTY-SIXTH STREET

Gentlemen:

Our order dated covering

for our contained the following statement:

"SHIPMENT TO BE MADE ON OR BEFORE _____
 Unless advised to the contrary at once, we will understand
 that shipment will be made on or before this date."

We have assumed in the absence of contrary advices from you, that you will
 make shipment by _____ at the latest, but as prompt shipment is now very
 essential, we wish to be assured that there will be no delays, and you will please
 advise date by return mail when shipment will be made.

If shipment has been made, send us shipping papers with invoice at once,
 and in the event that you have already done so, please furnish shipping particulars
 when replying nevertheless.

Yours very truly,

OTIS ELEVATOR COMPANY
 W. E. HODGMAN,
 General Purchasing Agent.

By

 R E P L Y (Do not detach from above)

Mail to:

Otis Elevator Company,
 11th Avenue & 26th Street,
 New York City.

_____, 19__

THE ABOVE ORDER _____ SHIPPED _____

FROM _____ VIA _____

REMARKS _____

SIGNED _____

FIG. 55. FORM LETTER FOR FOLLOWING UP
 MATERIAL SHIPMENTS

Form Y-606 (Rev. 3-1-16)	PROGRESS REPORT	_____ 19__
MATERIAL ORDERED BY YOU ON YOUR REQUISITION NO. _____		
OUR P. O. No. _____ AS FOLLOWS:		
WILL BE SHIPPED _____		FROM _____
VIA _____		_____
REMARKS:		
PURCHASING DEPARTMENT, W. E. HODGMAN, GENERAL PURCHASING AGENT.		
BY _____		

FIG. 56. PROGRESS REPORT ISSUED TO DEPARTMENTS
OR FACTORIES

representatives sent out to secure information regarding the progress of manufacturing and shipping.

When purchasing is done in a central office for a number of factories, the latter must be advised of the promises secured and the progress made in obtaining shipments. The factories must not be left in total ignorance regarding their raw material. When they have themselves stipulated the date of delivery, and the material is moving along to them on a pre-arranged time schedule, it is not necessary for the purchasing department to report that the schedule time is being kept. But in every case of delay, and when the schedule is departed from without prior instructions from the factory, then the factory must be kept advised of all changes and developments. A form for this purpose is illustrated in Figure 56.

Assuming that delivery has been effected in accord-

ance with the contract, still the goods may be several hundred miles from their ultimate destination. As I have explained in previous chapters, the shipper has no responsibility after he has delivered the material to the transportation company at the point designated in the contract. It is important, therefore, to keep informed concerning the various shipments that may be en route. This is the duty of the traffic clerk, who must follow up the shipments and get the transportation companies to send out tracers when necessary. If local purchases are made f. o. b. the seller's store, arrangements must be entered into with trucking concerns for delivery. This must be done in regard to incoming freight on the railroads before all questions of delivery can be considered as finally settled.

CHAPTER XIV

FINAL ROUTINE WORK OF THE PURCHASING DEPARTMENT

Invoices.—There is great variation in the methods employed by industrial establishments in dealing with the routine work connected with invoices. This variation is frequently caused by the difference between the systems used by the accounting and financial departments, with which this section of the purchasing department naturally is closely allied.

Any attempt to discuss all these variations would involve dipping deeply into the variations in accounting and financial methods, which I cannot do in the present treatment. I do propose, however to cover the salient points, in order that the reader may be enabled to understand fully the functions of an invoice and the nature of the routine work involved in putting that invoice into proper shape for payment, thereby completing the purchasing cycle.

It will have been noticed, from the description of routine work already given, that prior to the moment at which an order is issued, practically all the work of the department is based on the requisition, but that just as soon as an order is issued, all routine work is based on the order. In the processes described in the last chapter, the copy of the order had been carried to the point where delivery had been

secured. It should next be passed along to the invoice department. This scheme enables the invoice clerk to have always at hand copies of all orders on which invoices have not been received. If, as previously stated, copies are not kept segregated in this manner, and if it should be necessary to search through the general order file to ascertain what invoices were not received, an enormous amount of work would be involved, for some purchasing departments issue several hundred orders each day. When one realizes that invoices, under the best conditions, cannot come in for a day or two, that the majority of them do not come for a week or two, and that some are delayed even for months, he will appreciate what a search through the file would be.

Sellers should be followed up for invoices covering material delivered but not billed, since a bill that is received several weeks or months after material is delivered is certainly more difficult to check than one which is received at approximately the same time the material is received. It is essential, also, to the proper operation of the cost-keeping and financial departments, to obtain receipt of invoices promptly. The responsibility for getting these lies, clearly, with the purchasing department. While it will be found neither necessary nor advisable to employ an extensive system in following up orders for invoices, still they should be gone over systematically at regular intervals, and delinquents should be notified. Not much difficulty will be experienced in this respect, but some invoices will fail to arrive unless inquiry is made in regard to them.

Methods of Recording.—In the first paragraph of this chapter I referred to the variation in the methods of proceeding with the routine work connected with invoices. The first point of contention is expressed in these questions: Should a complete record be kept of all invoices as they are received? And if one is kept, on whom should rest the responsibility of doing the work? Some purchasing departments have inaugurated such a scheme, and later abandoned it as unnecessary. Other departments have transferred the work to the accounting department. In still other cases, conditions have been reversed, and the work of recording has been relinquished by the accounting department and taken up by the purchasing department.

The answer to the first question is that a record should by all means be kept, since it is essential to right buying. Invoices have a peculiar tendency to get lost or go astray, particularly if they are passed around from one department to another. A seller will call up on the telephone, or write, asking why some invoice has not been paid, and the answer may be given that it cannot be found. Let this occur with the same concern twice, and the standing and rating of that purchasing department goes down the scale rapidly in the eyes of the seller. It has been emphasized repeatedly that the higher the standard of purchasing is maintained, the greater is its potentiality for successful operation. Every seller is attracted by good buying, which includes unfailing promptness in handling invoices and regularity in paying them. This attraction of sellers draws bargains to the pur-

chasing agent's desk, secures priority, and obtains preferences.

The answer to the second question depends mainly on the organization of the establishment and the location of the departments. Some large purchasing departments are arranged so that they are adjacent to the accounting departments, the invoice clerks in one being in close touch with those of the other. It is then immaterial which department keeps the record. Some executives insist on all invoices going first to the accounting department in order that it may be able to compile figures regarding the obligations for which the financial department must make provision and arrange the information concerning the dates. In the absence of counterbalancing considerations, for the reasons stated in the last paragraph, and also because until invoices are finally approved they are documents of tangible importance to the completion of the purchasing cycle—it may be generally conceded that they should go first to the purchasing department and, if possible, remain in the department until approval is completed.

An example is given in Figure 57 of a form for recording invoices. This needs little explanation, as the headings of the various columns make obvious the purpose of each. To secure ready identification, all invoices should be numbered seriatim as they arrive in the department. This record gives the date on which invoices are received, as well as that on which they are finally passed. If they should be sent out of the department for any reason, a record of this fact, with an explanation, is also kept.

INVOICE RECORD							Date _____	
Date	Firm	Invoice No.	Amount		Sent out of Dep't.		Date Returned	Final Approval
					For Cash Discount	For other Reasons		

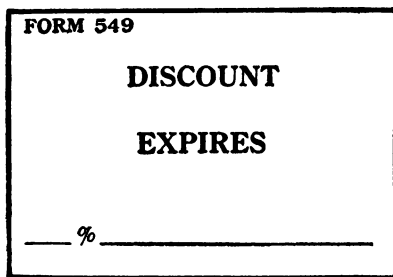
FIG. 57. FORM FOR RECORDING INVOICES

If an invoice, for any reason, must be sent out of the purchasing department, the fact should be noted on this record

Preliminary Work.—After the invoice has been recorded, the next thing to do is to scrutinize the date when payment must be made to secure the cash discount. It is essential to adopt some effective method of keeping this date prominently before all persons who have anything to do with the invoice. Space must be allowed for certifying purposes; it frequently happens that an invoice is so crowded with printed or written text that no open space is left. In some cases the method of pasting a slip on the invoice is resorted to; in other cases this has been abandoned, and a rubber stamp is used. Both schemes are open to objection, but the preference should be given to the latter. The main objection to this is that, owing to the lack of space on the front, the impression must frequently be stamped on the back, and then it is necessary to turn the invoice over to verify the certifications. This drawback, however, is less of an ob-

jection than to have an additional sheet attached to the invoice. Figure 58 indicates a good form of impression to use; this may be stamped on the invoices by the clerk who makes the record of them.

Checking Invoice With Order.—The next step in connection with the invoice is to check it with the order. This is the logical order of procedure, but it is permissible to change this routine somewhat, according to circumstances. It is better to check with



FORM 549

DISCOUNT

EXPIRES

____ % _____

FIG. 58. RUBBER STAMP FOR INVOICES TO DRAW
ATTENTION TO CASH DISCOUNT

the order first, because, if quantity or price were found to be incorrect, there would be no object in checking the extensions. The check against the order is the main safeguard against paying an invoice twice. Figure 53 illustrates the reverse side of the copy of the order kept in the purchasing department. Every invoice must be entered; it is enough to give simply the date and the amount. It can be readily seen that a second invoice for the same date and amount ought never to be approved, but this mistake sometimes occurs, for human nature is never infallible.

It will be noticed that the record on the back of the copy of the order is arranged for notes on the follow-up procedure, so that a very complete history can be kept on this document with the minimum amount of work. A point which must not be overlooked is that the requisition number appears on the order, the order number is on the requisition, and the invoice number is on the order. Consequently, the controlling papers connected with any order can be obtained at any moment with the least possible amount of trouble.

In the checking of the invoice against the order, there are some other features which must be watched. It must be seen that the description, grade, and so on, correspond. If the material is subject to inspection before delivery, the inspector's reports must be secured and examined to see whether the material has passed satisfactorily the requisite tests. When the invoice has been completely checked with the order, a distinctive check mark should be placed upon it to show that the process has been completed.

Checking Invoice with Material Received.—This is another feature in which great variation exists. In existing practice, the receiving department sometimes reports to the accounting department and sometimes to the purchasing department. It would be impossible to discuss intelligently and to the point, within a limited space, the many contingencies that might arise from the adoption of one or another of these methods. The purchasing department should certainly be informed of the safe arrival of the material before finally approving an invoice. I shall outline

here three simple schemes, any one of which may be used to that end.

1. The receiving department can make a complete record of all incoming material on loose-leaf sheets in triplicate, as shown in Figure 59. Either small, separate sheets—which would correspond with each invoice—or large sheets, can be used. If individual sheets are used, one copy can go to the purchasing department, one can follow the material to the department which requisitioned it, and the third can remain as a permanent record with the receiving clerk. This distribution cannot be made if a large number of items are placed on one sheet and rewriting is necessary.

2. As illustrated in the form "C" shown in Figure 38, a copy of the original purchase requisition can be returned to the receiving clerk, who fills in the information and returns it to the purchasing department, where it can be checked with the invoice and, if desired, attached to it. The latter feature is insisted upon by some auditors. The disadvantage of this method is that in ordering the material, the requisition may undergo changes which would necessitate altering that document, and the receiving clerk must make an independent record for other purposes. This procedure entails additional work.

3. A copy of the order, as illustrated in Figure 60, can be sent to the receiving clerk. On this the receipt of material can be recorded, and the document can be returned to the purchasing department to serve the same purpose as the copy of the requisition, named in the last paragraph. This scheme

NAME _____			F.O.B.
ADDRESS _____			Freight Charges
Date	Quantity	Unit	Description of Material
Received on account of Order No. _____			
			Receiving Clerk
Inspection Report _____			

			Signed _____
			Inspector
Material received into Stores		Attached to Invoice No.	
Signed _____		Signed _____	
Storekeeper		Invoice Clerk	

FIG. 59. RECEIVING CLERK'S RECORD OF RECEIPT OF MATERIAL

One copy ultimately goes to the purchasing department and a second copy follows the material to the inspector and subsequently to the storeroom. The upper half can be in quadruplicate, if desired, so that the receiving clerk can retain one and forward another to the purchasing department as a prompt notice of the arrival of goods

point, there are good and sufficient reasons. For example, in some establishments all invoices must bear the signature of the party actually receiving the goods, a rule which necessitates sending the invoices out of the purchasing department for this purpose, and getting them back again.

In all the instances cited, there is another object besides the securing of an acknowledgment upon the receipt of the material: namely, the sure prevention of duplication of payments. It is self-evident that the receiving clerk's receipt—whether it is on a special receiving slip, on a copy of the requisition, or on a copy of the order—cannot be attached to two separate invoices. Even if, in any individual case, it is not the custom to attach these documents to invoices, the protection should still be positive, because the receiving slip should be canceled in some definite way as soon as it is checked with the invoice. In the discussion of stores problems I shall be obliged to refer again to the receiving department, but what I have already said is sufficient, so far as the strictly purchasing essentials are concerned.

Checking Prices.—In the case of many orders no price appears, or perhaps a discount is quoted applying on the standard price list, or simply a base price is quoted. This matter was covered in Chapter VII, and illustrations were given which showed convenient ways of keeping these records and price lists. An invoice clerk is constantly in need of this information, and he will find that a loose-leaf system, as described in Chapter VII, is invaluable. It is im-

possible to dispense with it in any department that checks invoices for more than a few kinds of materials and supplies. Incorporated with this price record there should be, in an abbreviated form, the particulars of each contract in force. These memoranda transcribed from the contracts should be sufficient to enable the clerk to check the invoice without reference to the contract itself.

Classifying and Checking Extensions.—Both of these features should be taken care of in the purchasing department. That department, since it is more familiar with materials, and since it has the original requisition designating the classification, is in a better position than the accounting department to do this work. Likewise, in connection with the extensions, there is need for a man familiar with trade discounts and some trade customs, for frequently the unit prices are inserted on invoices without any indication as to whether the unit is a dozen, a gross, a hundred, or a pound. Only familiarity with trade usages and customs will enable a person to make the proper distinctions. Experience has proved that the checking of extensions cannot be slurred; therefore work of this kind should be assigned to a man who has the necessary qualifications.

Checking Freight Charges.—On the invoice of every article which is received at destination, and on which a charge for freight or delivery is paid, this charge should appear, in order that it may be properly classified. The allocation of freight charges to general expense is a loose and inadequate method. The freight charges on some materials are equivalent

RECEIVED		F. O. B.	
QUANTITY		FREIGHT	
PRICE		EXTENSIONS	
JOB No.	CHARGE TO	CLASS	AMOUNT
FORM 941			
APPROVED			

FIG. 62. RUBBER STAMP FOR APPROVING INVOICES

Each of the spaces should be utilized for the purpose indicated before the invoice is finally sent out of the department for payment

to 25 per cent or more of the invoice price, and if these charges did not appear under the same classification as the invoice, there would be serious discrepancies in costs accounting. It is for this reason that, in the verification of an invoice, the delivery point must be indicated and the amount of the transportation charges must be inserted. (See Figure 62.)

Another reason why these particulars should appear on the verification of the invoice is that the f.o.b. point specified on the order must be checked with the delivery actually made by the shipper. When these do not harmonize, the necessary adjustment must be made with the seller. The receiving clerk should always specify on his reports the transportation charges on incoming material. The accuracy of

these charges can be checked by a member of the purchasing department, or, if the establishment maintains a traffic department, it may be done by that department.

Final Approval.—The signature that determines the final approval of the invoice converts it into a document of tangible value. Naturally the signature should be that of some person in authority who is thoroughly familiar with the various checking processes, and who would be able, without too close an examination, to detect any glaring mistake in them. If the final approval is given in an entirely perfunctory manner, it might just as well be pronounced by the office boy as by anyone else. The exit of all invoices from the purchasing department should be recorded on the form shown in Figure 57.

Securing Cash Discounts.—Throughout the discussion concerning the checking of invoices, I have assumed that the checking is done to permit the invoice to reach the financial department in time for the latter to make the payment minus the cash discount. If the verification of the invoice cannot be completed in time for the cash discount to be secured, it should be sent to the financial department with a request that it be returned, after payment has been made, to the purchasing department for completion of the approval process. When invoices are sent out of the department, for this or any other purpose, the fact should be noted on the invoice record. (See Figure 57.)

The regulations of most auditing and financial departments will not permit of the payment without

final approval; in such cases, of course, this will have to be given. Whether or not it is given is not a matter of importance to the purchasing department, because, if any adjustment should be necessary on account of errors subsequently discovered, approval would have to be secured after payment was made, whether or not the department had approved the invoice. If, however, business is being done with reliable concerns, no difficulty should be experienced on this score. I have emphasized this point in previous chapters. The purchasing department is chiefly concerned in getting the invoices back in order that the verification may be completed. If it cannot get them, it will have to make copies.

Securing Credits.—It has been estimated by some business men that five per cent of all invoices are incorrect in some particular. This is an exaggeration if applied solely to some vital factor of the invoice which would change its total in dollars and cents. Minor features, such as dates, order numbers, and so on, are more frequently incorrect, but inaccuracy with respect to these, while annoying, is not so serious. Throughout the discussion of the whole purchasing subject, I have emphasized the importance of selecting sellers who use business methods of approved standards. Dealing with such concerns reduces all form of friction and, to a great extent, the probability of error, even in invoices, but mistakes will occur, and the purchasing department must make provision for them.

The manner in which the problem is dealt with by different concerns varies greatly, and many of the

methods used entail an indefinite delay in the approval of the invoice. A plan that often brings quick results is to return the invoice to the vendor, using a printed form which calls his attention to its inaccuracy. And yet this scheme, although widely used, has many drawbacks. It is sometimes difficult to get some of the invoices back. If they are subject to cash discount, this discount may be lost, or a controversy may arise in connection with it. If the checking process had been partly done, it would be necessary to cancel these checks and take the stand that no invoice had been received.

Requesting credits from sellers and holding invoices in the purchasing department until they are received, is also a very unsatisfactory method, for all of the reasons stated, and many more.

This is a big problem in large purchasing departments and it should be looked at in a broad light. Special care is necessary because the problem arises from comparatively small and petty matters which may become of considerable import if not taken in hand and disposed of daily.

The logical method is to debit the seller with the discrepancies, and then pass the invoice along to the financial department for payment. The adoption of this scheme absolutely prevents any accumulation of invoices in the purchasing department; it permits the cost department to proceed with their work without delay, and insures prompt payment of all invoices; it also makes a clean-cut issue between the buyer and the seller, and defines the position of the former accurately and positively.

The only element of uncertainty in this method of procedure is in connection with the seller's acceptance of the buyer's debit. For this reason, it is imperative that no debit be made unless the evidence of its correctness is convincing and unmistakable. When there is an element of doubt the matter can be taken up first with the seller, and an understanding can be reached before any definite amount is debited. The cases which involve uncertainty are, however, so few that they do not occasion any serious disturbance or dislocation of the regular operation of the routine work.

There are two forms that can be used for making

Debit Note No. _____		Applying on Invoice No. _____	
Charge to _____			
Address _____			
Quantity	Material	Amount	Reason for Debit
Date _____		Signed _____ Purchasing Agent	

FIG. 63. DEBIT NOTE APPLYING ON INCORRECT INVOICES

This form should be made out in the purchasing department which will then render a formal debit memorandum to the seller

JOHN SMITH MFG. CO. 100 SIXTEENTH AVE. NEW YORK			
DEBIT MEMO. NO. _____		Date _____	
TO _____			
We have debited your account as stated below:			
Your Invoice		Reason for Debit	Amount of Debit
Date	Amount		

FIG. 64. DEBIT INVOICE

If the regulations of the establishment permit, the purchasing department may use this form to send debit invoices directly to the seller. The form is in triplicate; the original is sent to the seller, one copy is attached to the invoice, and the third remaining in the purchasing department

debits applying on invoices. The first one, as illustrated in Figure 63, is made out in duplicate in the purchasing department. The duplicate is retained in that department; the original is attached to the invoice and accompanies it to the accounting department, where a formal debit invoice is made up from it and mailed to the seller. This method requires some duplication of work, because full details of the debit must be written up in the purchasing depart-

ment, and subsequently have to be copied by the accounting department. There is no getting away from this feature, however, in those establishments which absolutely prohibit the making of debits or credits by any except the financial or accounting departments.

If the condition just mentioned is not enforced, a form such as that illustrated in Figure 64 can be used. This can be made in triplicate—the original will be sent to the seller, the duplicate will be attached to the invoice, and the triplicate will be retained in the purchasing department. The advantage of this method is that it is not necessary to rewrite in some other department the particulars of the debit.

When either of these forms is used, full, complete, and explicit details of the charge against the seller must be given. They must be such as will enable the seller to see clearly the accuracy of the debit and the reason for making it. The debits should be numbered in sequence in the purchasing department, and these numbers should appear on the copy of the order and also on the seller's invoice in the space allotted for the approval. If the plan outlined above is closely followed, the most disagreeable feature in connection with checking invoices can be handled without difficulty and disposed of in a systematic, businesslike manner. The purchasing department's files are kept clear, the cost department has prompt information as to the actual cost of materials, the accounting department has no unbalanced accounts with creditors, and the financial department can make payments promptly, taking advantage of all cash discounts.

CHAPTER XV

PURCHASING PROBLEMS AND THEIR SETTLEMENT

How Problems Arise.—Mistakes are made in purchasing as in every other department of business. These can be rectified, and if either party has sustained a loss, an adjustment can usually be effected on an equitable basis, provided the party that made the mistake is willing to admit the error. Misunderstandings are sometimes more difficult to adjust, because each party may honestly think that his version is the correct one. I have emphasized, throughout the discussion of purchasing, that it is always important to bring into agreement the minds of the two parties to the transaction, and that when this “meeting of minds” is an accomplished fact, there should be documentary evidence to show for it.

Buyers and sellers do not appeal to courts of law to settle disputes that involve only trivial amounts. They do not do so, in many cases, even when the amounts involved are very large, and each party honestly feels that the true version of the case is his own exposition of it. The problems that actually arise for settlement are multitudinous. The records of the courts have been crowded with them ever since the time that such records were first kept.

The problems cited in the following pages are a

few of the simplest ones. The opinions expressed are not legal—they either are based on my own practical experience, or have been furnished by reliable authorities. They have this value, that they may be used to strengthen the arguments of any one who endeavors to adjust a misunderstanding.

Patterns and Dies—Few, if any, questions arise concerning patterns. If a pattern is furnished by the buyer, or if it is made for him by the founder, it is paid for by the former and is recognized as his property. The disposition to be made of it depends upon his instructions. Why should dies be treated differently from patterns? Custom has probably decreed that they should be. There is no other reason, and the day is coming when the question of dies will be treated in as broad a manner as the question of patterns.

If dies were always at the disposition of the purchaser of the forgings, many misconceptions would be eliminated. A clear understanding should be insisted upon by the buyer, in placing orders, as to the ownership of the die. If an order is given to a forge concern which involves making new dies, a price per piece is frequently agreed upon, which includes the cost of the die. In placing repeat orders, it is extremely probable that the same price will have to be paid, which means that the buyer is paying again for the die. Or if this is not literally true, at least he can do very little towards combating the price on the second lot if no arrangement has previously been made regarding the dies.

There is always the question of repairs to dies to

be considered, and a forge concern with not too fine a sense of fairness can make the cost of repairs what it will. A buyer should ask for a statement of the cost of dies separate from the quotation for forgings, and it is always well to have a definite understanding on certain points. For example, the buyer should know positively whether the dies are subject to his call, whether he is to pay the cost of repairs, or whether the seller is to keep them in repair. If the forging manufacturer keeps the dies in repair, the buyer should know whether this arrangement will prevent his claiming them. A definite settlement of all these questions will save much worry, and perhaps considerable expense.

Purchasing Agent's Authority.—A purchasing agent is assumed to be empowered to purchase the requirements of his concern. If, however, he should have private instructions not to buy certain materials, or not to purchase in excess of a stipulated amount, and should act contrary to such instructions, his action cannot be repudiated by his principals. The purchasing agent would apparently be acting within the scope of his authority as that authority is understood by the trade in general. The private instructions he had were not supposed to be divulged to a third person.

Responsibility of Salesmen.—Buyers should acquaint themselves with the responsibility of salesmen, and should have definite knowledge that the latter are authorized by the concerns they represent to make offers and accept orders which shall be binding on their concerns. If the salesmen are not authorized,

the principals may repudiate orders either made or accepted by them.

Orders to Agents.—Contracts or agreements entered into with agents are governed by rules similar to those made with salesmen. An agent, in many cases, serves merely to bring the two principals together. For example, a purchasing agent might complete an agreement with an agent to buy certain material, and the conditions, when accepted by the agent's principal, would complete the contract. If subsequently the buyer wished to modify the contract by increasing or decreasing the quantity, and agreed with the agent with respect thereto, and the agent failed to notify his principal, the buyer could not enforce the modification. In some cases, however, agents are appointed by the principals and are clothed with full authority to make contracts.

Price Lists.—Printed price lists sent to the trade in general are not in the same category as a specific offer to sell. The latter can be accepted by the buyer upon the issue of an acceptance or order—then a legal contract is in force; but this rule does not apply if an order is issued against a general offer in the shape of a trade price-list. Such general offers are subject to withdrawal, revision, or change, without notice.

Refusing to Sell.—A manufacturer or merchant is not compelled to give a reason for refusing to sell to any party who wishes to buy. There are certain classes of business, such as those represented by transportation, theatres, hotels, and so on, of a semi-public character which are forbidden by law to discriminate. Outside of those that come under these

regulations, however, no control is exercised, and it is not necessary to assign any reason for refusing to sell to, or do business with, a particular person or firm.

Quality.—A dealer or jobber does not warrant the goods he sells unless he gives a distinct understanding to this effect; therefore, in all important purchases a warranty should be secured. But on the other hand, when one buys direct from a manufacturer, whether or not a warranty is given, there is always an implied warranty for such goods as the manufacturer himself produces.

Return of Containers.—When there is an agreement that containers shall be returned, credit is usually allowed only when they are delivered in good condition at the seller's address. If there is no stipulation as to the place of delivery of the containers, the customary practice is for the buyer to deliver the containers to the seller, at the point at which the contract originally called for delivery to the buyer.

Leeway in Manufacturing Quantities.—In making large quantities of small parts—particularly some screw-machine products—trade usage permits an over-run or under-run of about ten per cent if nothing to the contrary is specified in the order. In all those cases, therefore, in which it is important to the buyer that he receive the exact quantity specified, it should be expressly agreed that no leeway in respect to quantity is allowed the seller.

Solvency of Vendors.—Buyers should be advised regarding the solvency of concerns with which they place contracts, because a seller who becomes bank-

rupt is released from fulfilling the contracts that he has accepted. A rising market might involve the buyer in very serious losses, but he would be unable to recover any part of them as damages against the bankrupt concern, even if it should be liquidated and pay all creditors in full.

Machine on Trial.—When a contract is made for the purchase of a machine, an article, or any apparatus, on the condition that a test first be made, a time should always be stipulated for the test. If no time is mentioned, then only a reasonable period can be taken to try out the machine. For example, sellers will sometimes put machines out on trial without naming any definite period, and a few days later they will telephone asking for a decision, stating that an opportunity exists of placing the machine elsewhere. If a decision is not given by the buyer, or if he delays returning the machine, he may be compelled to pay for it.

Trial Period.—When agreement is made to purchase a machine or article provided it proves satisfactory at the end of a trial period, and it should fail to prove satisfactory, the seller must be formally notified before the termination of the trial period. Otherwise the buyer may be compelled to pay for it. His acceptance is implied from the fact that he retained possession of the goods after the trial period had expired.

Damages to an Article being Demonstrated.—A person is bound to use reasonable care in connection with another's property which may, for any purpose, be entrusted to him, or which may be temporarily in

his possession. If an article left for demonstrating purposes is damaged as a result of negligence, the cost of repairing the damage will fall on the party in whose care it was at the time it was injured. If, however, any damage results from some flaw or defect in the article, then the owner is responsible.

Cancellation of Contract.—If a buyer endeavors to cancel a contract, the seller can naturally hold him for damages for the attempted breach. The damages would probably be assessed on the basis of the profit that would have accrued to the seller if the contract had not been suspended. A seller is not allowed to continue work, or to do anything which would enhance the damages a buyer might be called upon to pay.

Contracts not Specifying Quantity.—Many contracts are made by purchasing agents for material for such quantities as may be ordered between specified dates. Such a contract is indefinite as to both time and delivery. It does not obligate the buyer to buy at all; and conversely, there is no obligation on the other party to sell—it is not, in effect, a binding contract. If, however, a contract stipulates that the buyer will place orders with the seller for all, or half, or part, of his requirements, then it is assumed that the seller has acquainted himself with the buyer's needs and knows the quantities implied by the terms "whole," "half," and "part."

Orders without Prices.—A seller can charge only a "reasonable" price for goods concerning the price of which no previous agreement exists. If an exorbitant price is charged, it can be contested by the buyer,

but the determination of a reasonable price is dependent upon circumstances. A seller receives an order for rush delivery, or he furnishes it on the urgent solicitation of the buyer—in doing this, the seller may incur unusual expense, or he may have to procure the goods at an unusual price. If such is the case, a seller will generally inform a buyer, but a buyer's necessity may not allow of this loss of time—if so, the fact must be given consideration.

Penalty Clause.—A penalty clause inserted in a contract and merely designed as an endeavor to secure performance of the contract, cannot be enforced. A penalty can be enforced only if it is based on the measure of the damages which may actually be sustained because of a breach of the contract. Such a penalty is usually termed liquidated damages, and should represent the actual amount of compensation to which the injured party is entitled. This compensation would have to be a fair amount; otherwise the penalty could not be enforced.

Accepting a Portion of Goods Offered.—An offer to sell several items of merchandise when a separate price is named for each, does not permit the buyer to accept some items and reject others, unless a condition to this effect is inserted in the offer. The whole of the quantity offered must be taken, if the contract is to be binding. If the buyer wishes to take one or two parcels out of a quantity offered, and signifies his willingness to do so, this understanding constitutes a new offer and must have the seller's acceptance before it can be considered that an agreement has been reached.

False Statements in Negotiations.—If a salesman secures an order by assertions that are afterwards proved untrue, then the order is obtained by fraud. If, for example, he should claim that the goods in question are used in certain named places, or for certain purposes, and it was subsequently discovered that these statements were false, the goods may be returned to the seller. But the buyer must return the goods within a reasonable time after discovering the fraud—otherwise the seller will claim that the sale was ratified by the buyer's neglect.

Offers by Telegraph.—Offers to sell made through the medium of a telegraph company must be accepted in a similar manner, if the contract is to be binding, unless the offer contains a stipulation regarding time which would permit of an acceptance being sent by mail.

Carbon Copies.—Carbon copies will be accepted as evidence. If a seller disputes the accuracy of a carbon copy of an order sent to him by a buyer, the seller must be prepared to support his contention of inaccuracy by documentary evidence, or by the production of the original order.

Mistake in Contract.—Neither party to a contract is permitted to take advantage of a mistake by the other party, if the mistake is palpable and obvious. For instance, a stenographic error resulting in the insertion of a cipher that makes a price read \$100 instead of \$10, would not obligate the party responsible for the mistake to pay the larger amount, provided the hundred dollars could be proved an absurd price.

Crating and Packing Charges.—If a contract is silent on the question of charges for crating or boxing, a buyer cannot repudiate such charges if it is customary in the trade to charge them to the buyer. The charges, of course, must be fair and reasonable. A buyer cannot claim ignorance of trade practices and customs as an excuse for non-payment. Should there be no established trade custom, the buyer cannot be compelled to pay for crating goods, if the seller found it necessary to crate them in order to place them in a deliverable state at the point of delivery agreed upon.

Delivery Point.—If no reference is made in the order to the f.o.b. point, the general assumption is that the seller has executed his part of the bargain by delivering the goods to a common carrier, unless it can be proved that the universal trade custom is contrary to this practice.

Holding Back Delivery.—A buyer must take delivery as, and when, specified in the contract. If he instructs the seller to withhold delivery for a fixed or indefinite time, he is virtually authorizing him to store the goods for him, and should they be damaged the loss will fall on the buyer. All the seller is required to do, is to exercise reasonable care in connection with goods so held.

Shipping an Order in Part.—If a vendor, on receipt of an order, can ship only part of it, and does so, the buyer is not compelled to accept what is sent. The buyer's order was an offer to buy the whole quantity, and if it is to form a binding contract, it must be accepted and fulfilled intact.

Delivery Prior to Contract Time.—When a contract names a specific delivery date, the buyer cannot be compelled to accept the material at a premature date; if the goods are delivered too soon, he has the right to refuse to accept them. But if he does, the seller is not released from his obligation to make delivery at the time originally agreed upon.

Delivery Point not Specified.—If there is no express stipulation to the contrary, and if there are no circumstances which indicate a different intention, the point of delivery is understood to be the place where the goods are located at the time the order is sent to the seller. All orders, therefore, should specify a delivery point.

Delivery and Conditions beyond Control.—In those contracts in which time of delivery is an essential feature, it is customary for the seller to insert a clause referring to conditions beyond his control, such as strikes, fires, and so on. Should a strike last, say, one month, the seller could not compel the buyer to accept delivery one month later than the stipulated time, neither could the buyer force the seller to make delivery at the later date. If the stipulated time of delivery is not followed, the contract comes to an end.

Delivered at Destination.—If goods are bought “Delivered at Destination,” and the seller fails to prepay the freight, which is subsequently paid by the buyer, the seller is not relieved from the responsibility for the goods until they arrive at destination. If, however, it should become necessary to present a claim against the transportation company, the buyer would have to do it, since he paid the freight.

Prompt Shipment.—What does prompt shipment mean? So many orders are placed by buyers, and accepted by sellers, for “prompt shipment” that a definition of the term is essential, particularly in times when the market price is advancing. “Prompt shipment” really means that shipment must be made with reasonable promptness. Failure on the seller’s part to live up to this understanding entitles the buyer to purchase elsewhere and to claim as damages any difference in price he may have to pay. If the material can be readily purchased in the open market, the seller cannot be compelled, by process of law, to make delivery.

Transportation Company’s Obligation to Deliver Promptly.—Many questions have arisen regarding the liability of a transportation company for delays in transit, but unless neglect can be proved no claim can be enforced. At various times traffic congestion has delayed deliveries at practically all points reached by railroads. If the transportation company does not discriminate against one shipper in favor of another, and if it uses its facilities for the best interests of all, it cannot be held to account for delays.

Transportation Losses.—When material is bought “f.o.b. shipping point,” ownership is conveyed to the buyer at that point. As owner of the goods, the buyer assumes the risk of loss or damage in transit. In transporting the goods, the carrier acts as the buyer’s agent, and any claim for loss or damage must be settled between these two parties. The seller’s responsibility ceases when he has made a satisfactory delivery at the place agreed upon.

Claim against Transportation Company.—An increase or decrease in the market value of goods lost or damaged in transit, does not affect the amount of a claim, which must be based on the invoice price at time of delivery to the transportation company.

Credit for Returned Goods.—When goods are returned for credit, the general assumption is that the credit will apply on the account between the two parties. But if the buyer obtains no more goods from the seller, then the amount of the credit must be paid in cash within the credit period recognized as standard for such goods. It is taken for granted that there is no agreement to take other goods in exchange for those returned, or to buy others of a value equal to the credit.

Freight on Defective Material.—Transportation charges on defective material are an obligation of the seller, irrespective of the delivery point named in the contract. This rule applies not only to the charges incurred on the original journey of the material to the buyer, but also to those incurred in its return to the seller. Since the material is defective, the contract has not been filled and no proper delivery has really been made. The buyer, therefore, is under no obligation, but it is customary for him to consult with the seller concerning the return of the material, and to obtain instructions as to routing, and so on.

Liability of Railroad Company.—When a car is loaded by the shipper it is customary for the railroad company to stamp the bill of lading, "Loaded by shipper. The carrier is not accountable for weight, quantity, or condition of property." This statement

does not relieve the railroad company from its ordinary liability for the goods in transit, but if it should become necessary to make a claim against the railroad company, the latter could compel the shipper to show proof of weight, quantity, and condition of the material when it was loaded.

Receipt for Goods.—In giving a “clean” receipt to a transportation company for goods which are boxed, or which are so enclosed as not to permit of examination for defects, the buyer does not waive his right to make a claim against the seller for defects in the material, should any appear when the boxes are unpacked and the material is examined.

Inspecting Material.—The right to inspect and reject material, even when it is bought “f.o.b. shipping point,” remains with the buyer until the shipment has arrived at destination. If the material should not be of proper quality, it can then be rejected, for, if this is the case, the seller has not performed his part of the contract.

Terms Printed on Order Forms.—Many order forms used by the purchasing agent include a printed clause that sets forth the buyer’s terms. It is poor policy to make any stipulation of this kind, since arbitrary terms cannot be enforced. There are so many variations in terms that the really good buyer must permit flexibility in this respect, and not attempt to insist on hard and fast terms of his own choosing. If one of the order forms referred to were sent to a seller in response to a quotation, and the terms printed on the order were not in agreement with the seller’s terms, it would not constitute a legal contract.

Terms of Payment.—The terms of credit—sometimes called period of credit—mentioned in a contract begin at the date of delivery. If the delivery point is at destination, the buyer, in making settlement, is entitled to assume that the date of invoice is concurrent with date of arrival of the goods at destination. A stipulation to this effect should, however, be inserted in the contract, since usually the implied understanding is that an invoice dates from the time of shipment.

Cash Discounts.—"Two per cent, ten days," and "Two per cent, ten day from date of shipment," are not synonymous terms. The latter means exactly what it says, the former period is governed by the delivery point named in the order.

No Extra Dating.—Invoices that bear the imprint, or have terms stated on them, reading "No extra dating," require that the bill be paid at the termination of the discount period. For instance, "Two per cent, ten days, no extra dating" means that the invoice must be paid in ten days.

Cash Discounts and Freight Allowance.—When goods are sold subject to a cash discount and a freight allowance, the allowance must be deducted before the cash discount. The freight allowance comes in the same category as any other allowance or trade discount. Any deduction of this nature would be subtracted from the invoice before the cash discount was deducted.

Terms on Invoices.—"No anticipation allowed" is a term sometimes used on invoices, although it appears very seldom. The intention, when it is used,

is to prevent the buyer from endeavoring to secure a larger cash discount than usual by making payment before the date agreed upon.

Lost Invoices.—Loss of an invoice in the mails does not release the buyer from the obligation to pay for goods within the specified contract time. By properly addressing the invoice, affixing the necessary stamps, and mailing it, the seller has completed all that he is compelled to do; the post office really acts as agent for the buyer. If the contract entitled the buyer to, say, five per cent cash discount in ten days, he would have to pay within ten days from the time the goods were delivered, even if the invoice were lost.

Settlement of Debit by Part Payment.—When a creditor accepts, in full payment of a debit, a smaller sum than the actual amount of the debit, that debit is not completely liquidated, and he can still collect the balance. In all cases of this kind, there must be some consideration in addition to the payment. For instance, the payment may be made, and settlement may be effected in consideration of the payment being made in advance of the due date of bill, or in consideration of there being defective material or damages. Stipulation should be made to this effect.

Time of Payment.—A buyer may withhold payment until delivery is made by the seller at the point agreed upon. If there is a credit period, then payment can be withheld until its expiration. The payment of freight by either buyer or seller does not affect this question.

Credit Period.—When a contract is made in which no period of credit is mentioned, the seller may de-

mand payment on delivery. The buyer may not plead, "Trade usage or custom generally allows 30, 60, or 90 days." Possibly the seller may not consider that the buyer's credit warrants the risk entailed in allowing him the usual period in which to make payment. When purchasing on a credit basis, the buyer is bound to keep his credit good.

Payments.—If a debtor owes several amounts to one creditor and makes a payment, specifically stating that it is to be applied on a certain item, it must be so applied. The creditor may not accept the payment and then apply it against some other item, even if payment for that item is overdue. If no stipulation is made by the debtor when he sends a remittance, the creditor may apply the payment in whatever manner he pleases.

Date of Invoices.—It is a common practice of sellers to date all invoices the day shipment is made, irrespective of the point of delivery. Delivery and payment are concurrent conditions in every contract, unless a statement to the contrary is made. Therefore, in all cases in which the contract calls for "delivery f.o.b. destination," the invoice is antedated if it bears an earlier date than the time on which the goods reached their destination. Very little attention is paid to the dates of invoices that carry no cash discount. The above point is worth remembering—it might be important in instances in which goods took several weeks in transit.

CHAPTER XVI

RAW MATERIAL AND SUPPLIES

A Form of Wealth.—The acquisition of raw material and supplies for an industrial establishment is an investment made with a specific object in view. It is not an aimless exchange of one form of wealth for another. The property purchased is not supposed to lie dormant; although it may be at rest for periods of varying lengths before becoming an active and essential part of the manufacturing process.

All forms of wealth must be guarded, controlled, cared for, checked, and kept in such shape that the quantity possessed can be readily ascertained. An example of wealth in its commonest form is money; special institutions—banks—exist for its safekeeping and for facilitating its transfer between parties having commercial transactions. Conservation of natural resources and tables concerning them, the taking of censuses, and statistics regarding health, are other forms of controlling and recording wealth.

The property acquired as raw material for conversion into the finished product of a manufacturing establishment takes the form of bulk. It needs space and storage capacity for its proper conservation, for protection against physical depreciation and for disposing of it in accordance with pre-arranged plans.

Material possessions, whatever their nature, are liable to depreciate in monetary value; conversely, they may appreciate. While the latter is desirable, it is not a primary consideration in accumulating the raw material and supplies for manufacturing purposes. Depreciation in cash value, naturally, is not desirable while the goods are at rest in the stores, or during the period of their conversion into the finished product, and foresightedness in purchasing can, to a large extent, secure protection against it.

In discussing storage problems, many writers argue that there is depreciation in the value of material during the period it is carried in the stores, because of the various factors of expense connected with handling and storing. This is not literally true. These factors add to the cost, but they do not depreciate the value. This additional cost must be absorbed in computing the cost of the manufactured product. Now, as all expenses, all effort, and all outgoings of every description must in the last analysis appear in the cost of making and disposing of a product, and as the primary object is to keep these costs at the minimum, it is apparent that storage problems are of considerable economic importance.

Cost of Storage.—Due to the fact that storage considerations vary tremendously with the product, the location, the length of the quiescent period, and other conditions, there never can be any hard and fast rules concerning the cost of storage as an economic proposition. The permanent investment—that is to say, the cost of construction of the building—is a factor of some magnitude if the space occupied for

storage purposes is large and is located in an expensive section of a city or other congested district. Such a condition may well-nigh prohibit the utilization of any large area for this purpose. If space is curtailed for this reason, the storeroom itself may readily acquire a congested condition, with all the accompanying inconveniences of handling and storing. Only one result is possible where insufficient facilities exist—an additional expense. It often means that material must be handled more frequently than it would if ample facilities existed. Lack of space and the extra handling involved adds materially to the cost and may cause damage to the goods.

An investment in equipment is also necessary. This equipment is both fixed and movable, and is also affected by space conditions. With an ample area the material can be moved freely, easily, quickly, and at less cost than in a crowded storeroom. In figuring storage costs both forms of investment must be taken into the calculations, with the attendant interest charges and the depreciation charges on building and equipment.

The interest charge on the money invested in material and supplies is a factor in storage costs which cannot be determined accurately. Credit periods obtained by the purchasing agent vary greatly and, in some cases, it may be possible that the material will have passed through the stores and be under manipulation in the shop before any money is disbursed in payment. There is of course an investment and a corresponding interest on all material in the shop, and this continues until the product is

finally disposed of; but the present discussion is limited to the withdrawal of the material from the stores for use in production work.* Other material may be paid for even before it arrives at the factory. Strict accuracy in obtaining costs would necessitate the determination of the actual cash outlay on each article for the exact time which lapses between the payment and the movement of the goods out of the stores.

It is possible to determine accurately the items of general burden and overhead connected with cost of storage. Salaries and book-keeping expenses, wages incurred in receiving, handling and delivering, and also the insurance expense item, are generally possible of exact determination.

Factors which Reduce Values.—Depreciation in money value has already been alluded to. Good buying should reduce this to a minimum; but reduced values will occur sometimes from this cause in spite of the precautions taken in buying. If the market price of a material should decline during the storage period, and the finished product is largely composed of this material, it is extremely probable that there would also be a decline in the market price of the finished product.

In many cases, deterioration in the physical characteristics of materials in storage need not be considered, but in some instances there is a more or less intangible loss of quality. Perishable goods, as usually designated, are not often met with in manu-

* For a discussion of stores handling from the cost standpoint, see *Industrial Cost Finding*, Vol. 10, *Factory Management Course*.

facturing establishments; but semi-perishable material, such as paper and rubber goods, are liable to deterioration, and many other materials must have protection against rust and weather conditions. Also some materials suffer from abrasion in handling. While great care may be taken to prevent deterioration from these causes, some loss in value may occasionally take place.

Industrial storage problems do not include the bugbear of the retail merchant, who may find himself faced with a sudden change of fashion and fancy which may render much of his stock of little value. But there is a somewhat parallel pitfall in the fact that new discoveries, or processes, or developments in manufacturing may necessitate an improvement of the product, and whatever quantity may be in storage may become obsolete or partially so. The danger from this cause is naturally much greater in manufactured goods than it is in the raw materials. This risk of evolutions, however, does not often come so suddenly that one cannot "get from under" without any serious loss.

The Great Stores Problem.—An active industrial establishment has an insatiable maw for raw material. It consumes it without cessation. The general storekeeper knows that he must provide for the demand, that there may be neither let nor hindrance in the factory operations. Knowing the importance of this—knowing the imperative necessity for maintaining a supply in unbroken continuity—he could play safe and always have on hand such a great sufficiency that would take care of any situation or any con-

tingency. No good storekeeper would do this, however, for he would consider the economic factors that continually add to the cost, and the economic and physical factors which may degrade the value of the goods under his charge.

The element of time is the one which forces itself to the attention of the storekeeper. A banker, when he has more cash on hand than he requires for current needs, puts every dollar above the established safety mark out to work for him. The storekeeper also has a safety minimum, and he too endeavors to put into active service as much of his surplus as possible. This, as already explained, is because time is constantly working against him and is increasing the cost of all the material in storage.

Time is the great storage problem. Time is working against values twenty-four hours a day and every day in the year. There is only one possible way that time can render a service of a favorable character to the storage problem, and that is through a change in market prices which might appreciate the intrinsic value of the material during the storage period. From a strictly storage point of view this factor cannot be considered,—at least not from an economic standpoint. The only true way for the storekeeper to base all his calculations is on the economic factors. These can be established and if the combined judgment of the purchasing and production departments decrees a purchase in excess of the maximum set by the storekeeper, these two departments must set the storekeeper's bill of costs against the appreciation they hope to gain.

Profits in Storage.—While refusing to consider profits or appreciation in values from the store-keeper's point of view, there are nevertheless some profits in storage, although basic cost keeping principles do not and can not sanction an assumption of a profit in the storage function. From the inception to the final completion of the manufacturing process, costs must follow a well-defined and regulated course; and as the accretions follow one another in their proper rotation, the cost of storage must take its appointed place, ignoring any question of appreciation in values.

In view of the remarkable advances in the prices of nearly all raw materials during recent years the question may be raised as to what becomes of the so-called profits in storage. It has been quite possible for a concern to inventory 100,000 pounds of steel at a price of two dollars per hundred pounds, and a year later inventory the same quantity at four dollars per hundred pounds. It would seem at first glance that here was a profit of two thousand dollars; but this is far from being the case, unless during the interval between the inventories the price of all incoming steel had been at the figure prevailing when the first inventory was taken. This is an impossible condition in the advancing market such a change in price would indicate. The amount of steel in the stores when the first inventory was taken would be absorbed into the manufacturing costs at the price paid for it. All shipments of steel coming into the stores would likewise be absorbed at the advanced prices paid for each respective shipment. There re-

mains, then, only the last 100,000 pounds which may have come into the stores at a price of \$3.50 per hundred pounds. On paper this would show a store's profit of \$500 if the inventory were figured at market prices. Should this be the case then all outgoings from the stores from date of inventory must be absorbed into manufacturing costs at the inventory prices, otherwise serious discrepancies would occur.

Theoretical profits may be figured in the operation of the stores of an industrial establishment, but in practice a credit balance cannot be transferred from the stores to the profit and loss account, although it might be done in the case of a supply house, a dealer, or a jobber. In a manufacturing establishment the balance sheet should reflect the activities of the purchasing agent and storekeeper, but even favorable action by them might be counteracted by a stationary or decreasing price for the finished output of the factory.

Safe and Sane Storekeeping.—Too much worrying about moderate price fluctuations is apt to destroy good storekeeping. The fundamental economic factors may be lost sight of, and the luxury of overstocking may be indulged in, or it may result in the reverse condition of a shortage with all its attendant evils. From the storekeeper's point of view, therefore, the only rational, safe, and sound policy is to ignore these variations and allow the purchasing agent to deal with the problems of price fluctuations and market conditions. For a storekeeper of an industrial establishment to commence pondering whether market conditions warrant stocking up on

one thousand or ten thousand pounds of copper bars is dangerous.

Scientific rules can be laid down for determining the maximum and minimum quantities to carry in the stores, and the storekeeper should adhere rigidly to these rules. It is purely a problem of internal management, and external conditions must not be allowed to influence or interfere in the determination of the limits. When these limits are set in both directions, then other factors may properly be taken into consideration. When it becomes necessary to question the advisability of exceeding or curtailing the safety limits set by the inexorable demands of the production department and the economic factors connected with good storage, then the storekeeper may be called into consultation to set forth these factors as an aid and assistance in arriving at a decision regarding the departure from the rules.

To Store or Not to Store.—This is not a new problem, but it is a problem which is attaining a new importance. The significance of the question has recently been rapidly and forcefully compelling the attention of concerns which buy for manufacturing purposes, for resale purposes, for future distribution in any form, or for consumption. Unobtrusively perhaps, but none the less surely, the issue is penetrating every activity which involves the retention for a long or short period of materials and supplies in any form.

The new importance of the subject is largely because of better methods of figuring costs and a better realization of these costs in so far as the material in

the stores is affected. Probably the matter of storage costs has been brought more prominently to the front by the abnormal market conditions which have prevailed during the past few years.

A "sufficient unto the day" policy has brought some rude jolts to many manufacturing establishments. It is only necessary to look through the technical and trade periodicals of recent times to note the tales of woe of industrial concerns forced to suspend or curtail operations because of a shortage of coal or some other essential commodity or material. Mere price fluctuations do not create shortages except as they may be allowed to influence the buying or storage policy of individual cases. The question is deeper than just one of price. Lack of labor, car shortages, embargoes, and other factors have all brought the storage problem prominently to the front, and all of these have had their influence in causing a deeper study of storage costs, and consequently of the problem of whether to store or not to store.

Extremes of the Storage Problem.—Available storage space and other physical conditions, and also financial considerations may compel the adoption of a middle ground or neutral policy, but unhampered by these restrictions extremes are apt to be indulged in in times of stress. On the one hand is the storekeeper alarmed by tardy and deferred shipments, co-operating with a purchasing agent who is also alarmed but for a different reason, that of rapidly rising prices. This combination may develop wild buying and storing, which is merely speculative or

perhaps is consummated to secure peace of mind for the storekeeper and purchasing agent.

The other extreme is illustrated by a too complacent attitude of both the storekeeper and purchasing agent, resulting perhaps in hurried purchases from warehouses at prices so much higher than those prevailing for mill shipments that the storage costs are exceeded many times. Storage problems cannot be solved by chance or impulse, they are a matter of cool, calm calculation of relative advantages and disadvantages.

Psychological Factors in Storage.—For its effect on the worker there is nothing that is quite equal as a stimulant to productive labor to the knowledge that there is an abundance of material ahead upon which to work. Noting daily the dwindling pile of material or the inability to get freely what is needed from the stores, the workman will slacken his efforts, perhaps unconsciously.

As an illustration of this watch any laborer shoveling a pile of sand. As long as there is plenty, he will work with energy, but as the pile diminishes his energy also diminishes. Drop a fresh pile, and his energy seems to take on new life and vigor.

Some concerns have allowed their taxes to influence the storage problem. Alarmed over income and threatened excess-profits taxes, they have permitted themselves to invest part of their profits in stored supplies rather than to have the amounts appear in the profit and loss or surplus account. To evade successfully the real or threatened impost, this policy must be continued indefinitely from year to year;

and when all the risks of storage are taken into account and a close estimate compiled of the cost there can only be some isolated instances where such a venture could be considered as good business.

Standardization of Supplies.—Much useful work in the standardization of supplies can be effected through the storeroom. In the previous discussion of purchasing, emphasis was laid on this subject. The storeroom can also have a hand in bringing some of the problems to a satisfactory solution. The storeroom clerks come into physical contact with the various supplies, and a multiplicity of these ranged alongside of each other in the storeroom is convincing evidence of the need for reform. Some small tools come under a need for standardization also. It is not uncommon to find that several kinds of hacksaw blades are being used for similar work, because one department may not know that another department is requisitioning a different make. Such things as brooms, brushes, cotton waste, and so on, are peculiarly susceptible to duplication.

It is not economical to carry in stock several variations of articles of a similar nature when possibly the requirements of all departments and the whole establishment could be satisfied by a lesser number of styles. Having physical possession of these styles and having them arranged in adjacent receptacles, it can be demonstrated that some of them can be dispensed with, saving storage space and the expense of carrying a larger number of articles than absolutely necessary.

Almost innumerable instances could be cited of

the duplication of supplies kept in the stores. The practice pervades all sections of some establishments and is particularly noticeable in connection with office supplies. Many different kinds of inks, pencils, carbon papers, and so on, are purchased when the requirements of all departments, possibly, could be satisfied with one variety. If a store is carrying three varieties of an article with a minimum of one hundred units of each, it is quite possible that by carrying one class only in stock the minimum could be fixed at one hundred and fifty. Here we get a reduction in stock in one hundred and fifty units and a reduction in storage space that should be equivalent to more than this number.

Correct Definitions.—In Chapter II the question of correct definitions and specifications was covered exhaustively. Next to the purchasing department the stores department is interested in this matter to a larger extent than any other. More requisitions are sent from the stores to the purchasing department than from any other department, and it is therefore essential that these be correct to save time and trouble in both departments.

It is not an easy matter to get all the foremen in a large establishment to specify correctly each article in making requisitions for material from the stores, but undoubtedly considerable improvement could be effected in the conditions existing in many plants. Even if requisitions for material come into the stores with incorrect descriptions, the stores department should not repeat these in writing up the requisitions which go to the purchasing department. The stores

department is between the buyer and user of the material and can materially help in the adoption of correct and uniform methods of specifying and defining all materials and supplies.

Inventory Price and Market Value.—Customary accounting methods are not opposed to inventorying raw material at the market price prevailing when inventory is taken, but there are times when a sound business policy could scarcely justify this. There is a trite saying in the speculative world that "what goes up must come down." If this is true, then an inventory taken at the top of an unusual rise would be fictitious and simply show inflated profits. A later inventory taken after a severe downward movement might then indicate losses which had not actually been incurred.

When conditions are unusual, the customary methods are hardly applicable. For example, if the country has experienced a continued and prolonged advance in prices of all raw materials for several years and the indications for the future are that this upward tendency will be maintained, why then should not a manufacturer inventory the stores at the existing market price and figure it as profit? Even if a decline is not imminent, even if the exceptional price level is maintained for another year, the manufacturer will ultimately be faced with the reverse of the problem—a stock of raw materials contracted for at high prices and a rapidly falling market. At present the manufacturer may show his profits from the rise; his losses are still matters of the future.

The conservative manufacturer can only treat ab-

normal rises in prices in one way in-so-far as his inventory is concerned. He should figure that he has but half completed the transaction and that he had better not consider the increase in the values of his raw materials as a profit. He should consider that he is temporarily custodian of a goodly sum, a part of which may remain with him if his judgment has been sound and no adverse conditions arise. Should high prices continue from one inventory to another until they become, in a sense, almost normal, it may be permissible to consider part of the advance as profit, but a certain amount should be set aside as a reserve against a decline that is inevitable.

Storage Space and Production.—There should be a proper balance maintained between storage space and production requirements. Excessive space is an expense and increases the cost of all goods in storage, while cramped storage facilities has exactly the same effect in that it may hamper the free movement of the material or necessitate handling it twice. There is, perhaps, another more vital reason against insufficient storage space. It is this, that the minimum quantity of each class of material may be cut to a point where the proper factor of safety is disregarded.

In manufacturing a staple product (or one machine, such as an automobile), it is possible to determine with a nice degree of accuracy the proper proportion between storage space and production space; but when a large number of articles are made, some of which are at times in greater demand than at others, the question becomes more complicated. When ac-

curate areas cannot be determined, or when there may be some variation because of changes in manufacturing conditions, it is better to err on the side of amplitude. This direction contains fewer elements which tend to advance costs, and certainly has fewer risks attached to it.

Establishing the Maximum and Minimum.—At one time or another obsolete material will be found in every factory storeroom. If an infallible system existed for determining the maximum and minimum limits this condition would not exist. Obsolete material is dead material. It is worse than dead because, as the previous discussion has shown, the storage cost in connection with it is a live factor and continually mounting upwards. It is imperative therefore that all obsolete material be quickly disposed of at the best possible prices. But it would be better if obsolete material were not allowed to accumulate. Any study of the prevention of this involves a discussion of the maximum and minimum limits.

The minimum quantity of material in storage is established upon certain calculations, the principal one being the determination of a sufficient supply of raw material to make sure that the manufacturing process will proceed in unbroken continuity. Other elements which influence the establishment of the maximum and minimum are the available storage space, the length of time required to obtain the material, and the quantity which can be purchased most economically. All of these must be taken into consideration and carefully balanced.

The production manager, the storekeeper, and the purchasing agent all come in on this question. Taking the production manager's point of view first; he has to consider the output of his factory, whether this output is uniform through the year, and whether any manufacturing changes which may be contemplated are likely to make any change in the rate of the output or change in the character of the material.

Having determined this point in reference to each class of raw material, each item must be reviewed at periodic intervals. Failure to do this is frequently the cause of shortage of material or the accumulation of obsolete quantities.

It then becomes the duty of the storekeeper to have the raw material always on hand to supply the demands of the factory. The information given by the production manager furnishes the basis for the storekeeper's calculations. He knows that a certain material, for instance, will be consumed at an average rate of 300 pounds per week, and it becomes his duty to determine the minimum amount he can keep in the stores to meet that demand.

Every calculation of the storekeeper for the economic reasons already given, must have in view the maintenance of his stock at the lowest level consistent with safety. The establishment of a minimum is vastly more important than that of fixing a maximum. For every item in stores there is an exact quantity which is a safe minimum. Every time this is exceeded, rent, interest, insurance, and every other economic factor is working against the storeroom. Every time the quantity is below this exact minimum

the danger is imminent of a factory shut-down with its attendant losses. To make calculations which come anywhere near accuracy, he must figure the exact time required to receive, inspect, and store each item; he can then specify on his requisition to the purchasing agent the exact date on which the material must reach the factory.

It is here that the purchasing agent comes in with his information governing the delivery conditions. Some items may be freely obtained at a few days' notice, others may take weeks, and others months. In all cases delivery conditions are subject to changes, but the purchasing department should sense these changes and give due notice to the storekeeper to enable him to prepare his requisitions sufficiently far ahead of his requirements to permit purchasing and delivering the material.

Looking at this problem theoretically it has the aspects of a comparatively easy proposition, but in practice it is not so simple, because many of the calculations made by the three parties most interested do not materialize in exactly the manner estimated. It is necessary therefore to consider these variations and how to overcome them.

Assuming that the purchasing agent has entered into a contract for a staple material to be supplied in quantities of uniform amounts at regular intervals to conform to the maintenance of the storekeeper's minimum, still it may not be possible to secure this supply regularly. The purchasing agent must always have this contingency in view and must have auxiliary sources from which he can supply the

deficiency. If a deficiency has to be made up by purchases from warehouses at a higher price than the mill shipments called for in the contract, then a decision must be made as to whether it is a more economical proposition to pay the higher price or to raise the storekeeper's maximum limits. Recourse to the latter would increase storage costs but would enable a larger stock to be carried to tide over periods of temporary shortage.

The purchasing agent may find that the maximum fixed on certain items does not permit the purchasing function to be executed on the most economical basis. It may be found that purchases made in larger quantities can be obtained at substantial reductions in prices, or advantages can be secured in transportation and delivery charges. A careful consideration of these points may also result in a decision to raise the maximum limits.

One of the most difficult situations to deal with is in connection with a growing scarcity of a commodity and the attendant uncertainty regarding delivery. There have been, for example, many instances where a commodity could be obtained with reasonable certainty one month after placing an order. A growing scarcity may extend this time to two months, and then to four, and later to six months or longer, and even then the deliveries are very uncertain at best. A four months' promises of delivery may be a six months' performance. It is possible that the production manager does not want to commit himself so far ahead. Such conditions can only be safely taken care of by liberally increasing

the maximum limits to provide for all contingencies.

There are some minor reasons for changing the maximum, but the major ones given above cover the point sufficiently. The result of changing is the same in every case. The maximum which was established on a scientific basis, when departed from makes the danger of accumulating a stock of obsolete material a very live one. The risks are of varying degree. In many instances there is really no risk that the material will become obsolete, there is only the expense of carrying a large overstock when the market becomes easier. In other instances where a manufacturer may be making a number of different types of machines, the sales of these may be irregular and the quantity under construction in the shop may vary considerably, but nevertheless it is necessary to carry a stock of raw material to provide for a definite number.

Assuming that the minimum is fixed on a basis of three months requirements as determined by the average construction in the past, if delivery conditions become exceptionally bad it may be necessary to order supplies for eight or nine months in advance. This period, with the three months' minimum stock, means that a year's supply of raw materials or parts are under contract for a machine which might be radically changed at any moment. Situations and conditions such as these demand the most thoughtful treatment.

Fixing maximum and minimum limits has been called scientific guessing. Economic reasons demand as much science and as little guessing as possible. It

has been shown that important factors definitely control the establishment of a minimum, and that the flexibility allowable in establishing the maximum is caused, mainly, by the freedom of action essential in buying, as well as by an increase in the rate of production above the normal rate on which the minimum is based.

The Financial and the Stores Departments.—A fallacy is largely prevalent that because a concern is in a strong position financially, this very desirable state of affairs should influence the determination of maximum and minimum limits in the raw materials stores. On this point, C. Bertrand Thompson, writing in *Factory*, states:

The state of the financial department should determine how much stock of materials should be carried. . . .

If a perpetual inventory of each item in stock is maintained as it should be, it takes only a very short time to decide what is the safe minimum of stock to be kept on hand. This depends, of course, on the rate at which the material is used and the length of time it requires to get delivery on an order from the source of supply. When the balance on hand falls to this minimum, the purchasing agent should be notified to re-order for replenishment. Such notification may go on a requisition blank.

The quantity that he shall re-order on this requisition depends, not primarily on the price at which he can get it, but on the amount of capital which the firm is willing to tie up in raw materials and on the space available for storage.

The purchasing agent has nothing to do with either of these questions—one is determined by the policy of the financial managers of the concern; the other by the actual space physically available.

It would seem from this that if space is available, purchasing should proceed up to the limits of one's financial resources. Mr. Thompson ignores the economic factors connected with storage, and the only assumption possible is that advantage should be taken of a favorable market to buy for a rise. Such a policy is better suited to a jobber or supply house. Unless due consideration were given to many other factors it might lead to disastrous consequences in buying for the stores of an industrial establishment.

CHAPTER XVII

RECEIVING AND STORING RAW MATERIALS

Equipment and Manual Operations.—Large sums are constantly being expended in developing and perfecting machinery and tools to obtain quicker and better results in the production department. There are many cases where industrial establishments are prodigal in this respect but niggardly in others. This parsimony is frequently seen in connection with storage arrangements, or in the facilities for receiving or shipping goods. By way of comparison take the tool room in some shop and note the care bestowed on the tools, how carefully they are maintained and how precisely stored. But in the same establishment the raw material stores may be poorly arranged, loosely kept, and untidy in appearance.

Well arranged and equipped storage facilities are absolutely essential in any modern factory. The aim of the production department being to get the maximum output from a machine at the minimum cost, then all movements leading up to that machine or away from it should be governed by the same principles. All the reduction in cost effected by a new tool in the shop can be more than offset by the inordinate amount of time required to get the materials into incommodious storerooms and out again.

Planning and Locating the Storeroom.—In planning the storage facilities, proportion is one of two main essentials and location is the other. Storage space properly proportioned to the needs of a factory is an economic factor of great importance, and a well selected location will save much physical effort. In large establishments with many departments there will naturally be branch or subsidiary storerooms located at convenient and accessible points. Some raw material may undergo only one operation, or pass through only one department before going to the assembling shop or finished stock room. In such cases the material can go directly from the receiving department to the storeroom connected with the department in which the work is to be done. This question of planning locations scarcely comes within the scope of the present discussion, but to enable the stores to be handled in the most efficient manner it should be given proper consideration in the layout of a plant.

It is scarcely necessary to point out that individual circumstances and conditions will influence the amount of storage space and location. The product of one plant may require the storage of light and bulky raw material, another of heavy material, while others may use many small articles. However this may be, there are two physical factors in connection with any storage proposition which can be discussed along the same general lines.

Manual and Clerical Work.—The two factors referred to are the manual work and the clerical work connected with the operation of the stores. If one

of these were inaccurately done, the result would be confusion, regardless of how accurate the other might be. Clerical records can be very simple but very complete and absolutely accurate; but if a shipment of 8-32 machine screw nuts was dumped into the bin containing 10-30 nuts, or if a helper handed out 110 pounds of copper rod instead of 100 pounds, the clerical records would not tally with the contents of the racks and bins. The closer these two features can be brought into harmony the nearer is the operation of them brought to a state of perfection.

Generally speaking more attention has been paid to securing accuracy in the clerical work than in the manual operations, but the demand for better methods in the latter has developed many appliances for counting, weighing, measuring, handling and transporting raw materials and supplies. Many improvements have also been effected in the arrangement and equipment of storerooms, conserving space, reducing labor, and expediting and facilitating the handling of the contents. No discussion of stores problems could be considered complete without reference to some of these. It would be manifestly impossible to describe, or even mention, all the good things there are on the market at the disposal of and suitable for storeroom use. In calling attention to a few of them, therefore, it is not intended to discriminate against other appliances of equal merit and usefulness.

The Counting Problem.—Comparatively few things that are handled in bulk in factories are varied in size, weight, or character. Consequently the great problem is one of counting, with the least expendi-

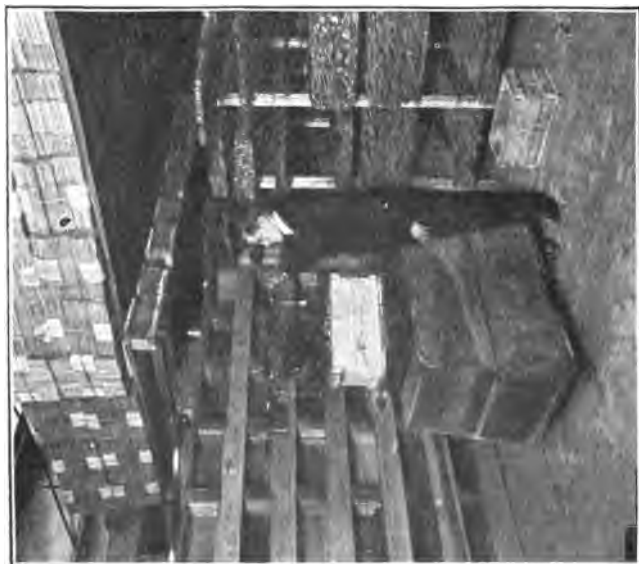


FIG. 65. COUNTING PARTS IN THE STOREROOM
OF EMIL GROSSMAN MFG. CO.

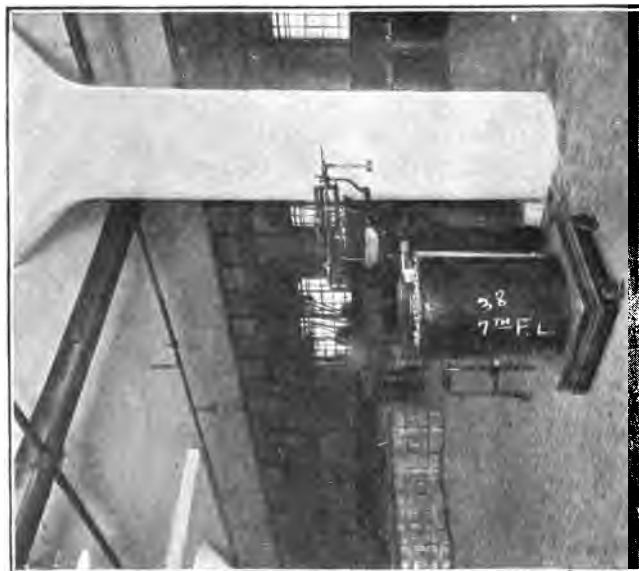


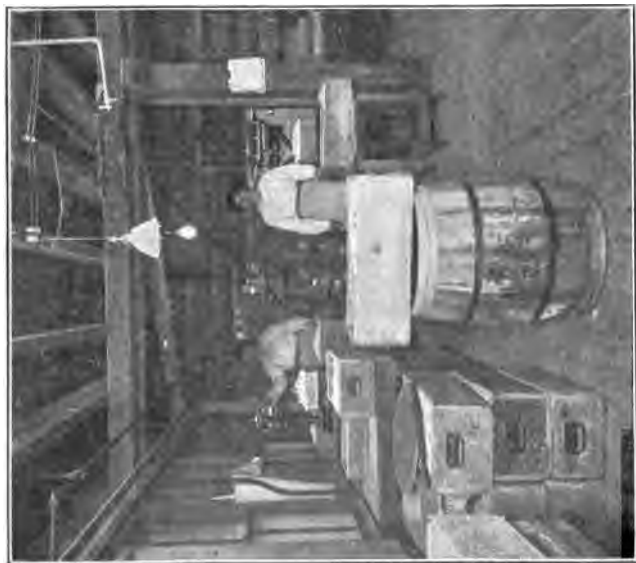
FIG. 66. MACHINE COUNTING IN THE STOREROOM
OF THE AMERICAN EVER READY WORKS
OF THE NATIONAL CARBON CO.

ture of time and labor, the masses of things which come in like units, or in units which vary so slightly in weight and size that the variations can be neutralized on a bulk machine count.

As a rule the hand-counter in an industrial establishment makes a mark with a pencil as he or she finishes a hundred. Thus in hand-counting, there are usually three distinctly different operations: the hand operation, the mind operation, and the pencil operation. Now suppose that just as a worker is about to put down a "hundred" mark, his attention is distracted by a loud noise or by someone speaking to him. When his mind returns to the task in hand is he likely to know whether he has made, or still has to make, that "hundred" mark? Such instances are frequent, and the almost invariable tendency is to "stay on the safe side." The counters argue that it is better to count out too many than too few.

Does dependence on this kind of accuracy "fit" with the careful calculations upon which modern business rests?

When machine operators receive from the stores 2020 or 2005 each of parts to be worked on, instead of 2000, the stipulated number, how can the foreman know where he is "at," or how can disputes be avoided with piece workers? Furthermore, if one looks at it "in the large," and reasons that the effect of each error grows more harmful the longer it, or its cause, remains unremedied, how can the superintendent know what is being wasted until the magnified result of some miscalculation shows up in serious form?



**FIG. 67. COUNTING THOUSANDS OF PORCELAIN
KNOBS IN THE EMPIRE CHINA WORKS**



**FIG. 68. COUNTING PARTS FOR BRASS BEDS IN
THE STOREROOM OF EHRENBURG MFG. CO.**

One point is especially worthy of mention, and it may well be emphasized here: The actual work of production, dominantly important though it is, has absorbed more than its share of serious attention and has thereby overshadowed many contributory problems, such as the counting of parts, stock, and material—operations which furnish abundant opportunities for leaks and losses.

Next in importance to the inaccuracy and lessened efficiency caused by unnatural mindstrains, are the expenditure of time and labor. It is evident that if a man counts 1000 small articles by fives, he performs 200 separate and physical and mental operations. If the articles are so large that he must count by twos, then 500 physical and a similar number of mental operations must be performed. A conservative estimate, therefore, places the average handcount ratio of the minimum number of operations to the number of articles to be counted at one manual and one mental operation to each count of five pieces.

Counting Methods.—All counting methods now in use, logically divide themselves into five divisions, or separate systems including hand-counting. Eliminating the hand counting, the use of which is only permissible for very small quantities, the four remaining systems can best be described under the name of the type of equipment used, thus we have the "weighing and estimating method," the "even balance scale," the "proportional scale," and the "counting scale" or "counting machine" as it is generally known.

The expressions "counting by weight" or "by the pound" are often used to explain mechanical count-

ing, but they are not altogether correct. "Counting by balance" is more accurate because all devices that count, while more or less highly developed forms of scales, operate on the principle which says that an object placed at the end of a lever will balance two of the same objects at the other end, provided the lever is pivoted at the right point. Indeed with the exception of the weighing and estimating method of counting, in which the known weight is a necessary factor, the most modern systems of mechanical counting are not dependent on the known weight of the objects handled at any stage of the operation. The only thing required in that respect is that these objects be in weight units suitable to the ratio capacity of the counting device employed.

To gauge the efficiency of the different methods of counting by balance, it is advisable to remember that industrial counting is divided into two kinds of tasks. One is the counting, or measuring out, of stated quantities for disbursement to departments or machine operators. The other is the determination of how many things there are in bulk lots of unknown quantities. This requirement provides the severest test of mechanical counting efficiency.

With these points clearly in mind, the differences between the various methods can be more clearly explained and will be taken up according to the order of their generally accepted efficiency.

Weighing and Estimating.—This method of counting represents the first step between hand counting and the use of a machine made specifically for the purpose. It is still in use to some extent.

In using the weighing and estimating method, the weight of a given number of the articles to be counted—preferably an even number for the sake of quick calculation—is first obtained, usually on a regular weighing scale. If 200 articles of uniform size and weight, for instance, weigh three pounds, then exactly twelve pounds of the same pieces must contain a total of 800 pieces. (See Figure 69.)

Greater speed and fewer operations are the advantages of this method over hand-counting, but it still invites inaccuracies from mental computation. It is also doubtful if the common insensitiveness of a scale made simply for weighing ever permits much greater accuracy when used for counting. Very few weighing scales of any considerable capacity can be compared with mechanical counting devices as to sensitiveness. And the degree of sensitiveness is the chief factor in determining the efficiency of a machine that counts by balance. The least hesitation of one of these devices in responding when the burden on the platform is increased or decreased is a flaw in the accuracy of the machine. Exceedingly quick response of a high grade counting-by-balance device, technically termed a "sensitive break," is absolutely necessary to accuracy.

Even Balance Scale.—This system of counting also represents one of the earlier attempts to improve on hand-counting by means of a mechanical device.

To count out 2,000 articles with an even balance scale, 500 articles, for instance, are first counted out by hand and placed on a tray or receptacle on one side of the balance, or scale. By putting an equal



FIG. 69. TYPICAL COUNTING OF SMALL PARTS IN
STOREROOM OF THE JONES SPEEDOMETER PLANT
345



FIG. 70. COUNTING SHEETS IN THE BOOK-MAKING
DEPARTMENT OF THE BARTLETT-ORR PRESS

quantity of these articles on the opposite tray an even balance is struck, of course; and, if the original or base, hand-count was correct, the balance scale holds 1,000 pieces. Then the five hundred pieces on one side are put with the five hundred on the other and enough pieces put on the empty tray to balance the scale again, making a total of 2,000.

To count a bulk-lot of unknown content by this method, it is first necessary to count by hand a "base number" lot—as described above—which may be 100 or 500 articles, depending on the size of the lot to be counted. Then a series of balances are made, as in the first described use of this scale, until the remainder is too small to create a balance, when the hand method is again employed.

Proportional Scales.—Proportional scales are made to work according to certain set even ratios; and the ratios usually range from 10 to 1 up to 200 to 1. A scoop hangs from the end of the scale beam, serving as the counter-poise. On the 10 to 1 scale, one hundred small pieces in the counter-poise scoop will balance 1,000 similar pieces on the platform.

To count the contents of unknown bulk lots with this scale, the material to be counted is put on the platform, while enough pieces are put in the counter-poise scoop to bring the beam to a "low balance." Then a single piece is removed from the scoop, giving a "high balance." Next, enough pieces are taken from the platform to make a perfect balance. The total of the pieces removed from the platform is added to the total of pieces on the platform, which

total has been determined by multiplying the ratio of the machine by the number of pieces in the counter-poise scoop.

To count out a specified number of pieces with the proportional scale, a number of pieces are placed in the counter-poise, in number equal to $1/10$, $1/50$, or $1/200$ of the total quantity to be counted, the proportion depending, of course, upon the set ratio capacity of the scale in use. The platform is then burdened with a load of pieces sufficient to bring the beam to the perfect balance point. Without further adjustment of beam or counter-poise scoop, it is then possible to count out as many lots as desired by simply repeating the process of loading the platform to the balancing point. These scales can also be used for the purpose of weighing material as well as for counting. (See Figures 69 and 70.)

Counting Machines.—The counting machine, which retains the form of a scale, has reduced the process of mechanical counting to the point where, with the exception of the comparatively small hand count necessary to provide the ratio number necessary to operate, all mental computations have been eliminated. The results are secured almost automatically and the total counts are indicated in plain figures on graduated counting bars, which are attached to the beam. These machines have the usual small scoop to take the ratio count of pieces, but this scoop or ratio pan, slides along the counting bar instead of resting in fixed position on the counter-poise.

Counting machines are made in a great variety of sizes and capacities from the delicate machines, Fig-

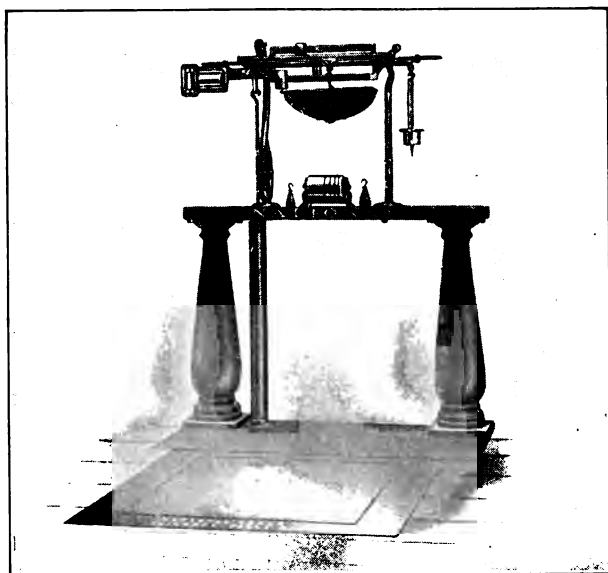
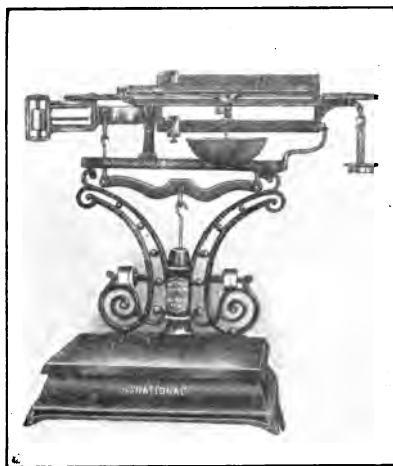
ures 71 and 72, which count 25,000 pieces to the ounce, up to machines of heavy dormant type, Figure 73, which counts tons of heavier pieces.

To obtain the count of an unknown quantity of pieces with the counting machine, the tare of the package or contents is first set out on one or the weighing beams, of which there are usually two. From the contents of the package the number of pieces required for the ratio pan are taken out, the number required for this purpose is indicated on the counting bar. The ratio pan is then moved along the counting bar until the beam is in balance. A pointer immediately above the ratio pan then indicates on the counting bar the exact number of pieces resting on the platform.

When it is desired to count in certain specified lots, say 500, the tare of the package is set out as above indicated, the pointer is set against the 500 mark on the beam, and the package is then loaded until the beam balances.

There is assuredly no room for comparison as to simplicity, speed, or automatically certain accuracy between the few simple mental and manual operations required by the "balance" method and the old, primitive, hand-method, which requires scores, hundreds, or thousands, of time-and-energy-consuming motions.

It is obvious that a succession of hundreds or thousands of similar acts is purely mechanical, and that the use of machinery, wherever economically possible, is a conservation of time and energy. Why should we have adding machines in the office and no me-



FIGS. 71, 72, AND 73. COUNTING AND WEIGHING MACHINES

chanical counting devices in the plant? Each is an application of the science of mathematics to the solution of a problem of obtaining a maximum saving of time, and mental and physical energy by means of a short cut.

A true short cut of this sort eliminates the use of the human brain as a mechanical recorder—and frees it for far more useful work. The general morale of workers as a whole has been greatly improved since machines were made to relieve the mind of monotonous tasks. A general great improvement in efficiency means greater profits.

Weighing Methods.—Inaccurate and careless weighing is inexcusable in an industrial establishment. It is inexcusable anywhere, for that matter, for if a recorded weight is not correct nothing has been gained, except perhaps a vague idea of the weight. But such approximations cannot be tolerated in a factory turning out small parts. Suppose, for instance, a storeroom issues one thousand pounds of brass rod to be used for making a screw machine product. If five thousand finished pieces are produced from this quantity, an exact calculation can be made of the amount of metal in each finished unit, as well as the scrap. But if the storeroom scales were incorrect to the extent of only ten pounds plus or minus the one thousand pounds, accurate cost keeping would be impossible. Such a condition repeated from time to time over a year would show radical discrepancies somewhere.

Correct weighing is a fundamental of the highest importance in determining the efficiency of oper-

ations, and anything short of accuracy is positively harmful. Too little attention has been paid to procuring scales of the proper type for the various kinds of materials handled in the storeroom. The prevalent custom has been to send a requisition to the purchasing agent to buy a bench scale or a platform scale, as the case may be. Quotations would be obtained and orders placed in much the same manner as similar transactions for brooms or shovels. The failure to recognize the vital importance of scales in the operation of a manufacturing plant cannot be wholly charged to the purchasing agent, for it is the production department that has the largest interest in securing the right kind of scales.*

These instruments should be selected with just as much care as a new lathe or drill. The mechanical construction should be suitable for the uses to which they are to be put, and periodical inspection and testing should be insisted upon. The mechanical engineering and maintenance work of every industrial plant should include all weighing apparatus. To neglect these while at the same time making strenuous efforts to secure greater efficiency from the machines and tools on which the material is used, does not afford any guarantee that the paper results represent the true state of affairs.

Many instances could be cited of bad weighing methods, but beyond the emphasis they would add to the argument against such practices they would be

* The attention of the reader is called to the remarkable series of articles on Industrial Scales and Weighing Methods, by Herbert T. Wade, that appeared in *Industrial Management*, Vols. LII, and LIII.

without purpose. A little thought given to the matter cannot fail to convince anyone of the fundamental necessity for accuracy. To secure this, careful selection must be made in the first place, and continued care and attention given to the maintenance of all scales in use, with proper tests and inspection. Waiting until some flagrant fault or actual failure develops may mean that registering has been incorrect for an indefinite period.

Scale manufacturers have developed their product to a point where they can furnish practically anything demanded by the exigencies of any situation needing accurate weight records. It rests mainly with the user to specify the conditions under which the instrument is to be used, and not simply go into the market and buy, without investigation, the cheapest scale that has the required capacity. Often scales can be bought with the provision that they will be given regular inspection and test. Better methods in industrial plants require quality, not cheapness, and this engenders accuracy and efficiency.

Trucking Material.—The scientific handling of material in every industry has not received sufficient attention. Until the elevating truck was introduced, practically the only known means of transporting material on the floor was the box or fixed-platform type of truck. The separation of the running gear from the platform has revolutionized transportation in stores.

While the old style of platform truck must still be used for moving certain goods in a storeroom, the main reliance to-day is placed on the lifting or ele-



FIG. 74. MOVING BED FRAMES IN THE STOREROOM OF THE AMERICAN BED CO., ST. LOUIS, BY AN ELE-
VATING TRUCK. THE LOAD HERE IS 6500 POUNDS.

vating type of truck with the multiple platform system. These trucks can be obtained to carry loads of any weight likely to be handled in the ordinary industrial storeroom. They can be arranged so that the platforms have sufficient clearance for any floor conditions, and can negotiate any grades which can be mounted by an ordinary truck.

There are many types of these trucks in use, and while the construction of the steel frame and lifting mechanism varies to some extent the principle is the same in all of them. The platforms are simple and inexpensive, and a large number of them can be kept on hand. When not in use they are nested and stacked, thereby occupying little floor space. One big advantage of these platforms in a storeroom is that raw material of some kinds can remain on the platform, saving the unloading and stacking when the material comes in and the reloading on the truck when delivering from stores.

Some material of this character can be stacked in two or three tiers. If it is necessary to get out the back tier first, it can easily be done by running the lift truck under the first and second tier platforms, pull them out, and have ready access to the rearmost tier at any point desired.

Each platform really becomes a truck as soon as the transporting mechanism is run under it. This enables the receipt of material into stores to be greatly facilitated, because as many platforms as may be necessary can be loaded at the receiving point and moved immediately to their respective places in the storeroom. It is not necessary to unload these at



FIG. 75. STACKING FINISHED LUMBER IN THE STOREROOM OF THE BUFFALO PITTS CO., BUFFALO, BY MEANS OF AN ELEVATING TRUCK
355 The platforms on some of these trucks are lowered gently and quickly by hydraulic ram.

once and place the articles in bins or on shelves, as the platforms can remain where placed until sufficient help is at liberty to do the work. This greatly reduces the amount of labor required by the old trucking system, where the truck was run backwards and forwards, dumping the material on the floor, or causing delays by holding the truck while unloading and stacking goods.

The use of this system in transporting goods in the stores has many advantages. It cuts down the initial expenditure for equipment; it reduces the labor item considerably; much time is saved, because the unloading and re-loading of material may be eliminated; much of the floor space occupied by the old style truck is saved. Also, as the goods are not handled so much the risk of loss by damage is reduced. And, finally, the trucking system is quicker and more flexible. If a storeroom is receiving castings or any article which will ultimately go into the shop in quantities of 100, 500, or any other number, they can be placed on the truck platforms in these quantities and no re-counting or handling is necessary. They can then be delivered to the production department at a moment's notice by simply running a truck under the platform. In some stores the raw material can be very largely handled in this way on much the same principle as the use of tote boxes. In fact, the platforms can be arranged as tote boxes if advisable.

Lift trucks built for heavy duty are lowered gradually and effectually by a hydraulic check. For operating in large areas they can be equipped with electric drive. The head and front wheels are so placed

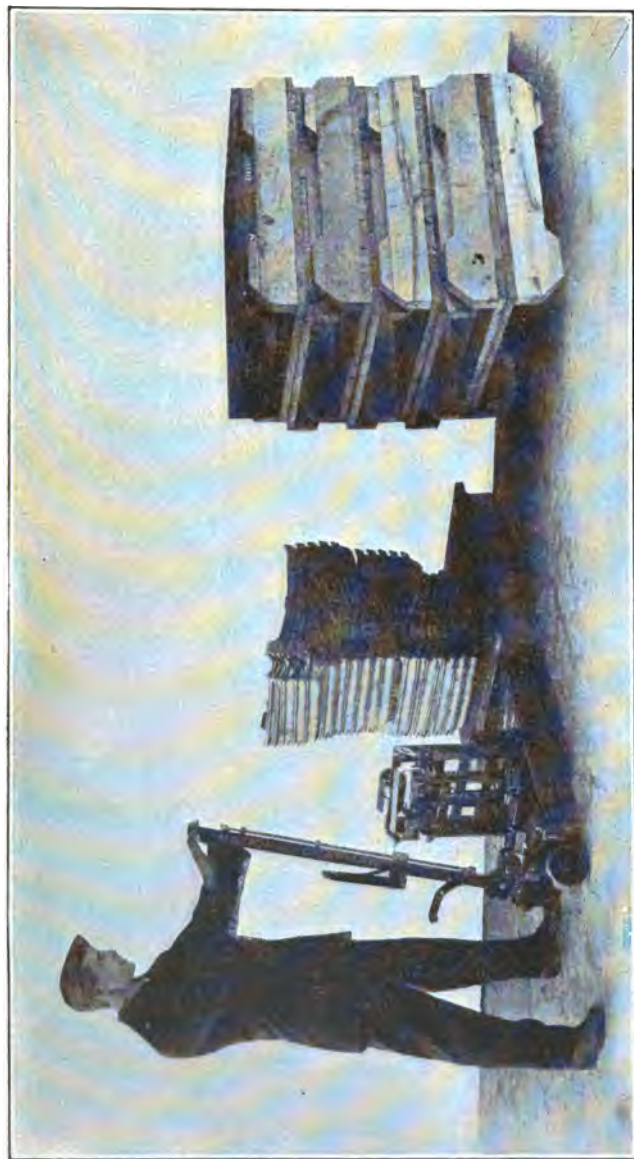


FIG. 76. A SCALE ELEVATING TRUCK PICKING UP A LOAD TO BE WEIGHED

as to turn a complete cycle, enabling the truck to operate in its own length in narrow aisles.

Figure 76 shows a further development in elevating trucks, on which a scale is mounted so that material loaded on the platform may be weighed (gross, net and tare weights can be quickly determined) and when transported wherever desired without rehandling. When transporting material the loaded platform is supported on a special set of side bars, so that there is no strain on the scale mechanism.

Conveyors.—The layout of a plant should provide for a location for the storeroom in close proximity to the receiving department. There may be conditions where this is impossible, and in those cases where a number of subsidiary storerooms are maintained in separate buildings, it is, of course, not feasible to have them adjacent to each other. Hand trucking may not prove the best means of transporting material in such instances, and it becomes necessary to use self propelled trucks or some kind of conveyor.

The very large size of many industrial plants, the great amount of ground space occupied, and the necessity of hauling vast quantities of material have resulted in the installation of various types of conveying equipment to make possible the rapid transportation of parts from one building or one section of the plant to another. The use of conveyors for this purpose keeps the manufacturing operations in progress without delays and reduces the cost of handling the goods to a minimum.

As there are so many types of conveyors, and as



FIGS. 77 AND 78. RECEIVING GOODS BY ROLLER CONVEYERS

Rolls of paper, above, delivered to the basement storeroom of the Empire Paper Tube and Box Co., N. Y. Below, goods received into the stores of Endicott, Johnson & Co., Binghamton. 359

nearly all types can be arranged for variations in location changed in construction to suit the character of the material to be conveyed, any detailed discussion of the various problems met with in storeroom practice is out of the question here.

Engineers and managers of industrial plants have of late been devoting considerable attention to the possibilities of harnessing the force of gravity to solve their trucking problems. Gravity is always ready to operate on the instant, twenty-four hours a day, three hundred and sixty-five days in the year, without attention.

Wherever large quantities of regular objects are to be moved in a fairly steady stream from floor to floor downward, or from one level to a lower one on the same floor, some type of gravity conveyor usually can be devised which will handle the material rapidly, economically, and with safety to both goods and workmen.

Even for moving materials from one point to another on the same level the gravity conveyor may be used when it is combined with short elevating sections operated by individual motors; for an insignificant amount of electrical power suffices to raise the objects to a position where gravity can get in its work, and the long stretches of distance are then compassed by gently sloping rollway.

Conveyors depending entirely on gravity naturally have their limitations, but in locations where the receiving room is on the main floor and the storeroom in the basement they can be adopted in preference perhaps to any other type. There are also cases



FIG. 79. COMBINED ROLLWAY, SCALES, AND CHUTE IN THE FINISHED STOCK ROOM OF HOTALING, WARNER & CO., SYRACUSE, N. Y.



FIG. 80. MOVING STOCK BY MEANS OF OVERHEAD BELT CONVEYOR IN THE FACTORY OF J. B. STETSON CO., PHILA.

where a central storeroom has been located at a sufficient height in one of the buildings so that all raw materials are elevated to such central stores and distributed by gravity to the various departments of the plant, thereby eliminating subsidiary storerooms.

One of the greatest advantages of the gravity roller conveyor system is its flexibility. By means of curves, switches, chutes, elevators, and other appliances the conveyors may be run around corners, through partitions and floors, and may be laid out practically wherever desired. Under the most favorable conditions these conveyors will carry packages with a smooth surface on a grade of only two and one-half per cent, but ordinarily a grade of at least four per cent is advisable.

The uses of belt conveyors are so varied that there is hardly any problem involving the conveying of light parts or materials, over short or long distances, that cannot be solved by some form of moving belt. Even pneumatic conveyors and carriers are used to good advantage in many industrial establishments, and none of these methods should be overlooked in considering the transportation problems.

Sectional Steel Bins and Shelving.—An office without correspondence files would be helpless; yet, unnoticed, many supposedly well-equipped factories are rendered just as helpless through lack of efficient storage methods. Were the value of every square foot of storage space determined and the stock considered as so many bins of pennies, nickels, and dimes, instead of rivets, nuts, and washers, the necessity of proper care would be quite evident.



**FIGS. 81 AND 82. METAL BINS IN THE STOREROOM OF THE
PACKARD MOTOR CAR CO., ABOVE; AND IN THE BUICK
MOTOR CAR CO., BELOW**

Steel equipment for storage purposes is of many types. Small and valuable articles may be kept in lockers, and exceptionally heavy material may need special construction, but generally speaking most of the material kept in bins or racks can be stored in either the closed type, the open type, or the rack type of receptacle.

These can all be obtained in the unit system of construction which provides for ample flexibility in length, width and depth. The 3-inch vertical adjustment of shelves and the approximately 6-inch horizontal adjustment of dividers permits the greatest economy in available storage space. This adjustable feature affords a saving of 25 to 30 per cent in storage space when compared with the construction of the ordinary wood bins and shelving. Furthermore, the simplicity of the construction permits easy erection by an ordinary workman, the only tool necessary being a screw driver. Another important point is that construction of this kind is a fire retardant. No building can be considered completely fireproof when it is equipped with combustible wood bins and shelving.

The Closed Type.—The construction of the closed type, Figure 83, consists, first of flat steel backs which extend the entire height and length of the assemblies. One back is necessary for each unit and acts either as a back to a single face assembly or as a dividing wall in a double face assembly. The uprights are attached at right angles to the back with stove bolts through holes in a back flange and corresponding holes in the backs. The uprights and



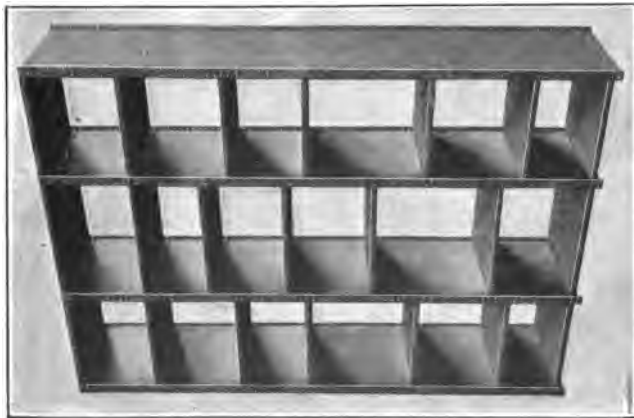
FIG. 83. CLOSED TYPES OF METAL BINS

backs are all punched for the attachment of shelves. The shelves are connected by means of stove bolts through holes in the side and back flanges. Thus, the uprights and backs each carry a portion of the shelf load.

The standard bin construction is such that an assembly of plain shelving can be made into a bin construction by simply attaching a bin-front in connection with the front face of the shelf. The bin-front and the shelves, being bolted to the frame, tie the entire construction together. This provides absolute rigidity, but does not prevent easy removal of an entire bin, nor the quick adjustment of the shelves. A 3-inch vertical adjustment is used which provides sufficient range for any storage space desired.

Open Shelving.—This type of construction, Figure 84, has a continuous opening through the assembly, and is used when requirements call for the storage of a material which is to be handled from either side. Both faces are alike, and the design is such that the complete assembly is self-anchoring. The uprights are formed from one piece of sheet steel, the front face of which is punched with holes for 3-inch adjustment of shelves.

The shelf is formed from one piece of sheet steel with edges turned on four sides. The front face of each shelf is attached to the face of the upright with four bolts. This arrangement acts as a knee brace and provides for lateral thrust. In other words, each shelf is so designed that when attached it adds to the stiffness of the entire assembly and thus effects a perfectly rigid construction.



**FIG. 84. SHOWING CONSTRUCTION
OF OPEN SHELVING**



**FIG. 85. OPEN SHELVING IN THE FINISHED STOREROOM OF AULT
& WIBORG CO., CINCINNATI**

As shown by the illustration, the shelving is built on the unit principle and is simply made up of uprights and shelves.

A bin construction can be made up if desired by attaching bin boards to the face of the uprights and along the front of the shelf by the use of stove bolts. Card holders can be attached to the faces of the shelves by inserting prongs through the slotted holes.

Racks.—The rack type of construction, as shown in Figure 86, is adaptable for the storage of Babbitt metal, spelter, drill rods, and so on, and is generally used in connection with the storage of dies, molds, patterns, cores, etc.

It is composed of heavy gauge formed sheet steel uprights and a rack shelf attached to the uprights by means of stove bolts. The manner of attaching makes the rack self-anchoring. In the illustration the ends of the front face of the shelf are flat. This part acts as a small knee brace which, when attached to the upright, provides for lateral thrust. Each shelf contains four of these knee braces, and, therefore, every shelf adds to the rigidity of the entire construction.

The front face of each shelf is punched with slotted holes for the purpose of attaching card holders. The uprights are all punched for the vertical adjustment of shelves.

The stock rack shown in Figure 87 is designed for the convenient and economical storage of rods and bars of steel, brass, etc. It is made in two styles—the single-hook, or wall pattern, and the double-hook type. Both styles are furnished in several lengths

for stock of varying lengths. The unit idea is carried out in the construction, so that the rack can be expanded or contracted to meet changing requirements. The rack can be easily and completely knocked down when it is desired to re-locate it in another part of the storeroom.

Hooks and tension bolts are of steel, the material best suited to withstand the combined bending and tensile stresses, while cast iron distance pieces of twice the crushing strength of steel sustain the compression due to load. The roll-up on the end of the hooks is important as it prevents the load from spilling off. It is impossible to overload the rack, and the entire space between hooks may be filled without causing undue stress.

Spaces are provided to accommodate a large variety of sizes without unduly mixing them. This eliminates the necessity of handling a great variety of stock before getting the desired size. End hauling of bars is eliminated and no valuable floor space is wasted thereby. The graduation in length of hooks—long at the bottom and short at the top—materially facilitates the removal of stock vertically where hoist and runway service is employed.

The wall pattern type, as shown in Figure 88, as its name would indicate, is designed to be placed against the wall and is particularly adapted for use where floor space is limited. Pans may be provided with either type of rack between the uprights for accommodating pieces not long enough to reach between the posts. Several lengths of pans may be used to obtain varying distances between posts.

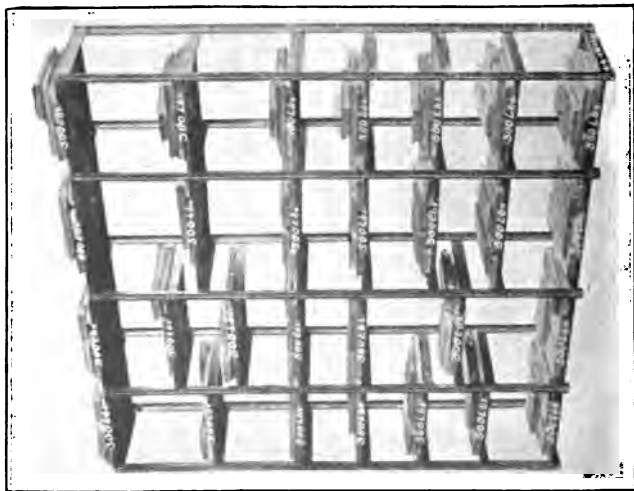


FIG. 86. STEEL SECTIONAL RACK
CONSTRUCTION

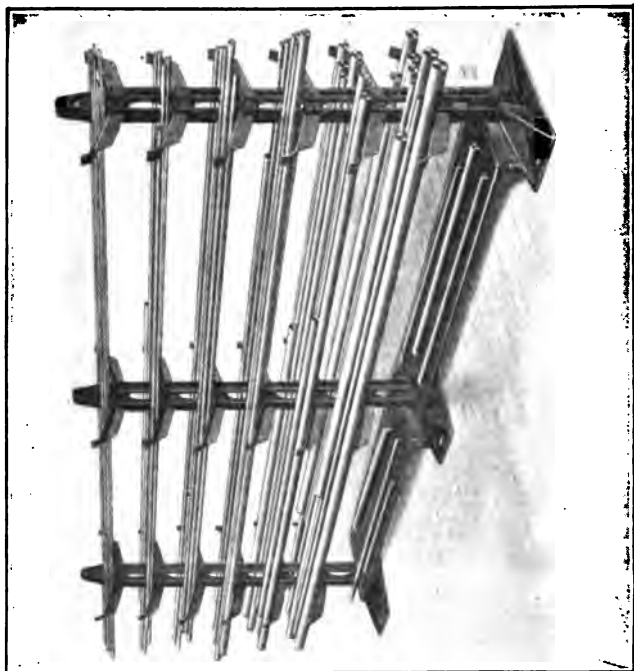


FIG. 87. STOCK RACK FOR TUBING, BARS, RODS, ETC.

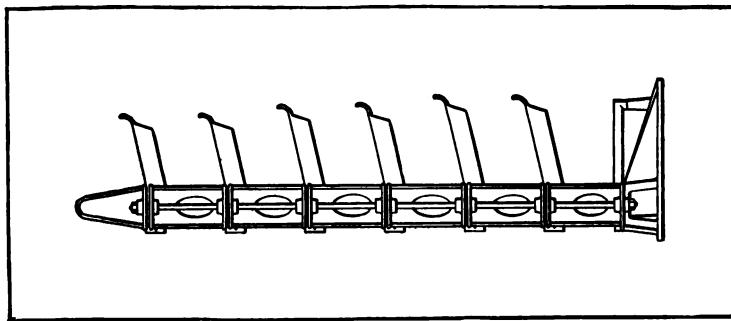


FIG. 88. WALL STOCK RACK



FIG. 89. RACK FOR STORING TIRES

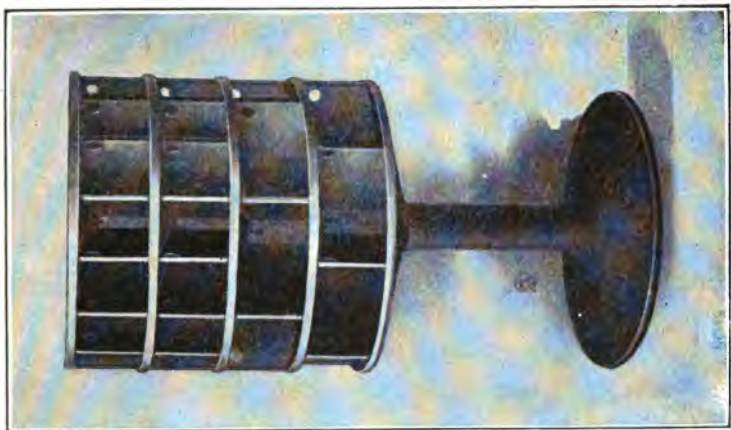


FIG. 90. REVOLVING RACK FOR SMALL ARTICLES

Open Air Storage.—The preceding discussion has been confined to interior storage facilities, but a storekeeper in some establishments has under his charge large quantities of materials, which are not kept under lock and key or are not stored in warehouses, such as have been described. In foundry work, for instance, there would be coke, pig iron, and scrap iron. In the case of the pig iron, the yard should be arranged with stalls open at one end, or partitions only can be used sufficiently far apart to accommodate one carload in each compartment. Two or three of the pigs should have the car number painted on them as a means of identification should there be any trouble with the metal, either in its use in the foundry or when analyzed.

With a travelling crane and magnet it is possible to keep pig iron and scrap in any kind of enclosure. It also enables all shipments to be segregated. The material can be stored in less space than when in loose, untidy, straggling heaps, and certainly it is under much better control.

It is sometimes necessary to keep several kinds of foundry sand, if both brass and iron castings are made, both for machine molding and floor molding. Open covered sheds properly subdivided should be arranged for this material. Fire clay also should be stored in a similar way. The latter is not so susceptible to deterioration by exposure, but the sand should have protection from the weather, as should also limestone and sea coal. All materials of this nature should be under rigid control. There is absolutely no reason why stores of this character should

not be subject to accurate record, but too often no records, or only remotely approximate ones, are kept.

When large quantities of structural steel are used, it is, of course, not practicable to store it in the same building or in the same manner as small articles, and it may be necessary to detail one of the stores clerks to keep track of this material. An ideal arrangement is for the cars to be unloaded at one side of the building, the bars, angles, channels, and beams stacked in regular order according to size, and stock should be drawn from the opposite end of the stack. As such supplies usually pass directly to the saw bench, very little work is necessary in keeping a record as the cuts are made.

Intensive Storing.—Using storage intensively and, at the same time, avoiding overcrowding or placing one class of material where it interferes with the free movement of another class, is a problem to tax the ingenuity of any storekeeper. In any discussion of equipment used in industrial storerooms, the subject can only be treated in a general way, unless one were to recite instances of unusual problems which have been overcome by some storekeepers. These problems are individual, and solutions have to be found to meet the special conditions. A visit made to the storerooms of almost any large industrial plant will afford a demonstration of some clever device to solve intensive storing.

It is common practice nowadays to use pegs for some articles, instead of placing them in bins or racks. Wall space which could not be utilized otherwise is made to serve a purpose. Some of these ar-

ticles, and also some of those in bins, which are drawn from stores in regular specific quantities are tied or bundled in these quantities. This saves delay in counting or weighing when the articles are requisitioned, and the material can be handed out without loss of time to anybody.

In a large plant where steel billets are used, the former custom was to dump them in heaps, until the storekeeper evolved the plan of unloading them onto platforms which are stacked on top of each other by a crane. When it becomes necessary to use the billets, the platforms are lifted by the crane onto self-propelled trucks and are transported to the rolling mill. This eliminates several handlings over the old method and economizes space.

Such mechanical aids as barrel stackers and sack stackers are utilized to good purpose in many storerooms, but it is still possible to see four or five men struggling with barrels filled with heavy material endeavoring to stack them without the aid of these appliances. Seventy-five per cent of this labor could be saved by using the mechanical stackers.

When an inventory of materials is taken, an inventory should also be taken of the non-productive labor used in receiving and storing the materials. Simply because a storeroom is devoted mainly to heavy materials it does not always follow that it is necessary to have brawny men to handle it. There are so many mechanical appliances to-day that physical strength in the human being is, by reason of them, largely equalized. The majority of men who labor with their hands are not willingly mentally

idle. They would just as soon work with their brains, but intensive, strenuous, mechanical, monotonous work dulls thinking. Sometimes a laborer, however, will work with his brain as well as his hands and produce a method of relieving the physical strain. There is ample room for this in some of the store-room operations.

CHAPTER XVIII

STORES INVENTORIES

Perpetual versus Periodic Inventories.—A short time ago a prominent technical journal devoted considerable space to a discussion of stores inventories. The principal argument advanced was that it is advisable to omit the regular annual or semi-annual inventory. Many opinions have been advanced from time to time on this subject, and as inventorying is a matter of vital interest to good stores keeping and as many misconceptions exist, it is essential to elucidate the various points.

A logical reason for the discontinuance of the practice of taking physical inventories at periodic intervals of material and supplies in the stores, would be that the perpetual inventory represented the actual quantities on hand, or that it was so nearly accurate as to make the difference negligible between the actual quantities and recorded quantities. It is important that the perpetual inventory should indicate the true state of affairs, or should come as near it as possible, for all the stores clerical work revolves around it. It is the stores ledger; and the account kept with each customer in the sales ledger of a concern should not be more accurate than the account kept in the perpetual inventory of the debits and credits entered against each stores account.

There are still to be found some manufacturers who keep no daily records, or perpetual inventory as it is called, of material on hand. They have some method of keeping track of material used in production work, and annually close the establishment for inventory purposes, at which time a general physical inventory is taken. In olden days such methods may have passed muster, but they cannot be tolerated under even ordinary conditions to-day. In intensive manufacturing they would be impossible, and nothing can be said in support of them.

On the other hand, some manufacturers claim to have developed the perpetual inventory to such a high state of perfection that it is unnecessary to take any physical inventory. Let us examine the advantages claimed by the adherents of this system.

The Perpetual Inventory.—This gives complete detailed information monthly, weekly, daily, or even hourly, if necessary, of the state of the material on hand, the rate of consumption, and the many valuable features essential in the exercise of purchasing and storekeeping which have been covered in previous chapters. These features alone would indicate that a perpetual inventory is imperative.

A continuing ever-ready record being essential, the question which presents itself is, whether this record can be brought to such a state of accuracy and perfection that periodic physical inventories can be dispensed with.

In some manufacturing plants this has been done, and many advantages and savings are claimed for the innovation.

NAME		CAT. NO.													
FOR		CLASS													
MATERIAL		PATTERN													
		Value		One		Equals		Drawing		Location					
		Date	Order No.	Ordered	Date	Order No.	Demand	Date	Order No.	Received	Date	Order No.	Delivered	Balance	Price
mo.				Order										Min.	
												For'd			
q															
p															
used from															
Am't															

FIG. 91. FORM OF PERPETUAL INVENTORY USED BY JEFFREY MFG. CO.

Instead of closing down the plant for several days or a week to take the physical inventory, a balance is struck of all stores inventory accounts in exactly the same way and at exactly the same time that balances are taken of accounts payable and accounts receivable.

One of the principal advantages claimed is that it eliminates the closing down of a plant and throwing out of employment hundreds, and perhaps thousands of workmen, involving them in a loss of approximately two per cent of their annual income or earning capacity; while at the same time plant expense goes on—for rent, interest, insurance and similar charges do not cease while the physical inventory is being taken. The salary of every person engaged in the inventory work while production is stopped is a dead loss; for it cannot be distributed as a burden on the factory product, because nothing is being produced.

Another argument put forward for abolishing the physical inventory, is that it is more likely to be inaccurate than the perpetual records, because the counting, weighing, measuring, and so forth, of the large quantities is very liable to be incorrect. This work is frequently performed under the pressure of time. The persons engaged on annual inventories often work long hours, and generally amid considerable confusion which is apt to cause many errors.

Those advocating the elimination of the physical inventory state that in actual practice a comparison of the actual results has showed several discrepancies between the annual and perpetual inventories, but

on re-counting the perpetual inventory was found to be correct in ninety per cent of the instances. Moreover, the total discrepancies between the two inventories was less than \$800 in a store on which the valuation was placed at nearly three quarters of a million dollars. This difference, of course, does not warrant the expense incurred in taking the annual physical inventory.

It is a practice of some concerns to set aside an amount every year for the purpose of inventory adjustment. This is done in much the same manner as a reserve for bad debts. Such a fund may never be called upon, but it is good sound business policy. Any such policy is equally applicable to any kind of inventory, hence it is not an argument for or against a perpetual inventory.

Perpetual inventory figures, the advocates claim, are more reliable than those of a physical inventory, unless the latter are checked by duplicate counting, weighing, and so on. If such a course is used, it amounts to practically the same as taking two inventories. But if the reliability of an annual inventory is dependent solely on one count or weighing, taken perhaps hurriedly, it is better to compile the annual statement of stores on hand from perpetual inventory balances.

Finally by keeping the storeroom clean, by regularity and order in arrangement, by careful methods in receiving goods into and delivering them out of stores, the perpetual inventory if rightly planned for the character of the stores, can be brought to a high state of accuracy.

The Physical Inventory.—The advocates of an annual or semi-annual physical inventory claim that it is absolutely necessary to use it as a check on the perpetual inventory which has been running for a period of six months or a year, as the case may be, without any positive check. During this period there may have been hundreds or thousands of entries to one account, and it is not to be supposed that this amount of book-keeping can be done without errors, some of which might be serious.

It is claimed that closing down for a period of about one week every year is a necessity in many manufacturing establishments—for repairs, alterations, replacements, etc.—and that such work can be done much better and more economically when the

PAST CONSUMPTION		
USED 19....	USED 19....	USED 19....
JAN.....	JAN.....	JAN.....
FEB.....	FEB.....	FEB.....
MAR.....	MAR.....	MAR.....
APR.....	APR.....	APR.....
MAY.....	MAY.....	MAY.....
JUNE.....	JUNE.....	JUNE.....
JULY.....	JULY.....	JULY.....
AUG.....	AUG.....	AUG.....
SEPT.....	SEPT.....	SEPT.....
OCT.....	OCT.....	OCT.....
NOV.....	NOV.....	NOV.....
DEC.....	DEC.....	DEC.....
TOTAL.....	TOTAL.....	TOTAL.....

FIG. 94. REVERSE OF FIGURE 93, SHOWING METHOD OF RECORDING PAST CONSUMPTION

workmen are not around. Even if there is no work of this character to be done, it is considered advisable to close down for a short period in the summer, when many workmen are asking for vacations. These vacations can then be disposed of practically all at one time, and a physical inventory taken in the workmen's absence.

Again, there are certain items used in manufacturing in reference to which a perpetual inventory can never be very accurate. Bulk material, such as sand, coal, fireclay, scrap iron, and so on, cannot be as correctly determined as regards their incomings and outgoings. For these it is imperative that physical particulars should be ascertained to enable calculation to be made for an inventory of any kind.

Furthermore, knowing that at a regular date a physical inventory will be made, induces care in keeping the perpetual inventory. If this check were discarded, the clerks keeping the perpetual inventory would be inclined to carelessness, and no great reliance could be placed on its accuracy. It is also claimed that the physical inventory has a "house-cleaning" value, in that it brings to light some material or articles which have been placed in the wrong bins or receptacles.

Finally, for legal reasons a physical inventory is advocated, because if it was ever necessary to go into court, a perpetual inventory would be ridiculed as a true statement of affairs.

Ideal Inventorying.—The foregoing remarks cover the principal pros and cons put forth in respect to keeping stores records by the advocates of both sys-

tems. The ideal inventory, in my opinion, is undoubtedly the perpetual record, posted promptly, maintained accurately and absolutely reliable. So accurate should it be that one can walk to any bin or rack and find there the exact quantity of material shown at that time on the inventory records.

Infallibility is an impossibility while the human factor has to be considered, and it is not to be expected that the many thousands of clerical entries on the records, and the corresponding number of manual operations in receiving and delivering the goods, can be accomplished without error. If this could be done, we should have the ideal record, showing always the exact state of every stores account.

The manner in which stores records are compiled and the documents from which they are written up do not as a rule permit of such accuracy as the entries made in the ledger accounts with debtors and creditors, yet no accountant would think of taking as correct the items posted to these accounts without the check of a regular trial balance. It is essential, therefore, that the perpetual inventory be also subject to some kind of check. While it may be possible that manufacturers of certain articles have found it possible to eliminate the semi-annual or annual physical inventory, it is probably because the nature of the product manufactured does not call for a very large variety of raw material, or it is such material that accurate records of it can be maintained with comparatively few clerical entries.

The question of the losses sustained by closing a manufacturing establishment for a few days or a

week, in order to take a physical inventory, is a matter for individual consideration. It is possible that some plants have quiet periods when no loss would be incurred by closing down, and at such times a physical inventory could be taken. These dull periods usually come around midsummer or toward the end of the year, when books are generally balanced; but even if this is not so there is no insuperable objection to a general inventory being taken at any time of the year that is convenient. A physical inventory is really a check on the perpetual inventory, and if there is any discrepancy between the two, what is going to be done about it? The cost accountant has not compiled his records from the physical inventory but from the same documents that have been used in writing up the perpetual records, so that from certain viewpoints it is immaterial whether an inventory is taken, or not.

The legal reasons which are said to exist for taking a physical inventory at the same time that the financial balance sheet of a concern is made up, do not exist in fact but only in imagination. If proper perpetual records are kept, and the documents preserved which were used for compiling the records, then these are just as good evidence as the books showing the debits and credits with customers.

It has been shown that the necessity exists for checking the stores book-keeping with the actual stores contents, and that it may be done by regular periodic physical count, providing it does not entail a loss of profitable productivity. To produce at a profit is what a manufacturing establishment exists

for. To suspend this function by closing down operations could not be considered as good policy.

The alternative to a periodical inventory is to check the clerical records by a physical method at convenient times, when it will not disturb production. In establishments of sufficient magnitude it is possible that the men engaged in inspecting raw material on arrival or similar work in the shop could be assigned to this work, if it is desired to have some one not actually taking part in the manual operations of the stores. This is some protection against collusion, but it may be found that the regular employees of the stores can be relied upon to take the physical inventory at such times as they are not fully occupied with the routine work.

By following this practice closely, and covering all of the stores within certain prescribed periods, the clerical records will not go very far wrong without the discrepancies being quickly discovered. Other requisites in inventorying are a clean storeroom, well kept and well arranged bins and receptacles, and careful, accurate, but alert help in both manual and clerical operations.

Posting Values on Stores Inventory.—It is not a general practice for the records kept in the stores to cover the value of the stock, but this is sometimes found advisable, especially in smaller concerns, and an illustration of a concise method of doing this is shown in Figure 96. In connection with the value of raw material and the pricing of it for cost purposes there is some difference of opinion in the disposition of cases where prices vary.

Article _____ Size _____ Bin No. _____						Verified _____		
Description _____						_____		
Unit _____ Max. _____ Min. _____						_____		
ORDERED		RECEIPTS & DELIVERIES				BALANCE		UNIT PRICE
Order No.	Quantity	Date or Req'n No.	Quantity	Amount	Quantity	Amount		

**FIG. 96. INVENTORY SHEET FOR USE WHEN ENTRIES ARE NOT
NUMEROUS**

The receipts should be posted in red ink, and added to the previous balance.

For example, let us assume that 100 units are received into the stores at 20 cents each, and 40 are issued to the shop, leaving a balance of 60. An additional quantity of 80 is then received into the stores at a price of 25 cents each, making a balance in the bins of 140. When further issues are made to the shop, at what price should they be charged out?

It is a practice of some establishments to average the price as soon as there is any change. In the example given above with 140 units in the stores, there would be 60 at 20 cents and 80 at 25 cents, or an average price of 22.8 cents. Is it correct or good practice to use the average price for the next delivery from the stores?

If 25 cents each represents the lowest market price, then the quantity on hand before the last shipment was received has appreciated 5 cents in value. Some concerns would charge them out of the stores at the advanced figure, but such practice may be dismissed without discussion. It is not a correct method for figuring production costs; and in so far as the stores account itself is concerned, it would simply mean that this account would show either a profit or a loss according to market fluctuations. As already pointed out this is not good policy.

Those who advocate that stores prices be averaged, argue that it is better to have one price apply on all material in the stores of one kind, it simplifies the price, it is less liable to lead to mistakes, and it renders the calculations connected with the annual or semi-annual balancing much easier.

The best practice, however, is to charge out the hundred units at a price of 20 cents and the following 80 at 25 cents. The theory is that all articles are taken from the bottom of the bin and that the material which has been longest in the stores should be used prior to later receipts. There is another and more important reason for this method of procedure. An order may be accepted from a customer, or a

[illegible]

FIG. 97. CARD FORM OF PERPETUAL INVENTORY

stock order is issued for the shop, to make up a number of finished parts, in either case this is done on the basis of the price of raw material then in the stores or the price at which it can be bought. It is, therefore, only reasonable and fair that this order should be executed with raw material priced on this basis, and not on an average price, which may apply on some later order.

Summary.—The man who knows most about his business seldom fails, and the one who knows least is usually the one who does fail. Nothing is of greater importance than a well kept perpetual inventory for advancing one's knowledge of the condition of that portion of one's investment represented by the stock of goods and materials in the stores.

Perpetual inventories require perpetual attention. Cost authorities are practically united in favoring

them. The difficulties in handling them have been largely due to a lack of attention on the part of employees. The benefits of maintaining a perpetual inventory having been discussed, the question of keeping accurate records can be covered by some very simple rules.

First: No material should be received into the storeroom without some form of advice in the shape of receiving clerk's report form as shown in "C," Figure 38, page 240. These tickets or slips are used to make the debit entries. If material is allowed to pass into the stores without some such document, no record might be made, or if one was it might be incorrect.

Second: No material should be allowed to leave the stores without a properly drawn requisition which must clearly indicate the quantity taken from stores. For instance, if the stores inventory for a certain article is kept in units of weight and the requisition asks for a number of the articles, it must be converted into units of weight before the articles leave the stores. These documents are used for making the credit entries, and their preservation is vital.

Third: Accuracy in posting entries is essential, as also is accuracy in delivering the correct quantities called for. Inaccuracies in the latter function would probably be discovered by the recipient of the material, but the clerical work of posting entries should be checked daily, unless a check by physical count is made at intervals frequent enough to enable the clerical entries to be checked back should any discrepancies appear.

Fourth: Perpetual inventories should be treated as cash is treated. Cash is verified often, or should be, and an inventory should also have regular periods for verification.

Fifth: The documents indicating the incomings and outgoings of material pass into the possession of the cost department, but they should be preserved there a sufficient length of time to cover the period when they may be needed to check back; that is, until a physical count is made.

CHAPTER XIX

RECEIVING, INSPECTING, AND STORING

Receiving Material at the Factory.—In Chapter XVI it was necessary to refer to the receipt of material and supplies purchased in order to explain the method of securing approval of the invoice, but the subject must be discussed more fully to cover completely the connection between the purchase of goods, their arrival at the factory and final disposition.

Nearly everything received at a manufacturing establishment passes into the control of the storekeeper. In very small concerns he may also act as receiving clerk, or this work may be combined with the shipping clerk's functions. But in larger establishments the receiving clerk may stand alone, unattached to any department. This is the preferable position, because his duties are closely allied to the purchasing, accounting, and storekeeping work, and it is desirable for him to be strictly neutral and not to have his movements controlled by any one of these departments. He can then serve them all with equal fairness.

Many concerns refuse to permit the receiving clerk to have a copy of the order, thinking that, having this in his possession, it may have a tendency to relax his vigilance. Not knowing the quantity ordered he

would be compelled to scrutinize the incomings more closely, and will get no help in doing this, such as he might receive from a copy of the order. This is a practice, however, which cannot be commended. If the receiving clerk is lax in his work and so little dependence can be placed upon him as is implied, then he is scarcely the man for the job.

There are good reasons for giving the receiving clerk a copy of the order. In the first place, in making his report, he must identify each item on his receiving slip with an order number, otherwise the purchasing department will be unable to check the receipt of material with the order. Also, without such a copy the receiving clerk will not know to which department the goods belonged. It would mean a great deal of work to investigate these matters after getting the receiving clerk's report. Furthermore, lacking the information, the receiving clerk might receive goods not ordered at all, or goods that had been cancelled, or quantities in excess of the order. Any one of these would be sufficient to tangle up matters so badly that, if nothing worse happened, it would mean a lot of trouble and expense for the purchasing department to straighten matters out.

I am firmly of the opinion that the receiving clerk should have a copy of the order, and that he should record all receipts on a form similar to Figure 59, page 286, or on any suitable form which would serve the same purpose. It should be in triplicate. The original can go to the purchasing department, and can, if necessary, be attached to the invoice. One copy can follow the goods to the inspector and finally

to the storekeeper, or if the goods go direct to some department without passing through the stores this copy would still follow the goods. The remaining copy stays with the receiving clerk and can be filed in a numerical sequence which should also be in the order of dating. The order of dating is the more important, because it is sometimes necessary to ask the receiving clerk questions regarding goods received, and invariably the date is used to enable him to look up his records.

Records of Goods Received.—Figure 38-C, page 240, illustrated a method of recording receipt of material on a copy of the purchase requisition and Figure 60, page 287, showed a copy of the purchase order to be used for the same purpose. If the receiving clerk did not have to keep any records for his own reference and could simply O.K. the copy of requisition or the copy of order and pass it along, this scheme would involve the least amount of work. But if he has to keep records it only means duplication of some portion of his work. Another bad feature is that so very often goods are not received exactly in accordance with the requisition and order. They may come in several shipments, which means that subsidiary forms must be used for recording the earlier receipts, withholding the copy of requisition or order until final delivery is made. In actual practice this is what occurs with the use of the form shown in Figure 60.

An illustration is given in Figure 98 of a form for recording receipt of material. In this case the receiving clerk is under the jurisdiction of the purchas-

buying and storing material. Poor finish or other superficial defect, incorrect size, irregularity in gauge, and so forth, should be detected at the entry of the material into the establishment and not postponed until it has passed into the production department. When it reaches that department there should be some positive assurance that it is equal in all respect to the standard ordered. Delays at this point of the progress through the manufacturing process might prove very costly.

Another reason for not delaying inspection is that it is obviously incumbent on the buyer to advise the seller of any defects immediately on arrival of the goods, or within a reasonable period. If this were not done it would be very difficult, in some cases, to get the sellers to take the goods back or to get any adjustment. The practice of receiving all kinds of materials and supplies into a manufacturing establishment and simply counting, measuring, weighing them, and then passing them along for consumption or use is far too common and cannot be too greatly deplored.

When discussing this subject, I have been met with the objection that it is not possible for many manufacturing concerns to maintain a receiving department, an inspection department, and a storeroom as separate entities. This may be true, but it is no reason for not properly examining and inspecting all goods received for use in the plant.

Inspecting Methods.—Every establishment, whatever its size, must have some person or persons to receive, inspect, and store material. In very small

concerns the functions can be combined in one man who should be capable of determining inspection questions. In large establishments the function of receiving and inspection can be combined, while in still larger plants the three activities can be entirely separated.

Inspection means the detection of poor quality, such as can be discovered by close observation or some simple tests; the detection of irregularity in the size of small articles; the measuring of gauges and sizes by simple instruments, such as micrometers, calipers and gauges. An examination should be made for flaws and poor finish; also whether goods have deteriorated from atmospheric conditions, poor packing or exposure to the weather. In fact the inspection of raw material should cover everything except such tests as may be necessary to carry out in the chemical laboratory or physical testing room.

The two latter methods should be applied to all materials which the technical staff has previously decided are vital in production work. The inspector, upon notification of the material which is to undergo these tests, should send as many samples to the chemical or testing room as required, properly identifying them with the order and shipment to which they belong.

Naturally there must be some means of knowing that goods have been inspected and, after the chemical or physical test, a form similar to Figure 100 should be used. This should be in triplicate or quadruplicate as may be necessary. In any case the purchasing department and production department should

space, or use a rubber stamp reading "Inspected" with his initials after it, and pass the report along with the goods to the storeroom.

Receiving Material Into Stores.—The raw material and supplies, after passing the inspector, are received into the stores. They should then be promptly placed in their proper receptacles or in the spaces allotted to them. This is a feature of stores handling which needs close watching by the chief storekeeper. When goods are to be taken out of stores, delay should not be tolerated, because usually a messenger or carrier is waiting. Incoming material is too often allowed to accumulate on trucks or in piles until, presumably, a more convenient time can be found for disposing of it.

Emphasis has already been placed on the importance of the manual operations and the necessity of their being just as accurate as the clerical work. If articles of any sort are allowed to remain scattered near the stores entrance, even for a short period, it is only natural that if a requisition be received for some of the same articles, it may be filled in the most convenient manner from the scattered heap instead of properly from the bin.

Finished Material.—In some establishments finished parts go directly to the assembling room. Others keep them distinct and separate from the raw material stores. While still others incorporate the finished parts stores with the raw material and supplies. The latter course is preferable, as a saving can be effected both in the manual and in the clerical help, as well as in storage space and equipment. It

should be recognized, however, that finished material may travel a somewhat different course from raw material in its exit from the storeroom. This point should be among those considered in deciding the location of the storeroom.

Finished material is of two kinds: it is either a component part of a machine and not salable except with the machine, or it may be a finished marketable article. The former is usually designated a finished part, while the latter is known as finished stock and is sometimes kept in a finished stock room. This item includes assembled machines, that is, the product of the factory ready for shipment.

As far as storage problems are concerned there is no radical difference in either the manual or clerical work connected with the storage of any of these articles. They are subject to the same regulations as the raw material—their entry and exit must be properly recorded under the same conditions and in a similar manner.

Storing Material.—There are some considerations common to any storeroom. For instance, material which is frequently called for should be within easy reach, and heavy material if it is not allowed to remain on platforms, as described in Chapter XVII, should be stored at a convenient height to be loaded upon a truck. The alleyways should not be too narrow, as the racks darken them, and insufficient space will make it awkward to get material out promptly.

A common fault is to find articles of the same kind in more than one stock bin. The old style of rigid

shelving and divisions was inelastic, and when the stock happened to be increased beyond the capacity of the bin allotted to it an additional location had to be found. This might be at some distance, but even if it was adjacent there was always the danger that its location would be overlooked. With adjustable shelving and racks, storing is greatly simplified. The illustrations in Chapter XVII show that there is no limit to the width or height of adjustable bins. Whenever the stock increases to a point where the space allotted will not take care of it, the extreme flexibility of the shelving permits of any necessary increase, so that all articles can be placed in one receptacle.

Again, if more than one bin or location is assigned to an article, the storekeepers are more apt to omit an item in filling a requisition, as they may find that one bin is empty and fail to remember that there is more of the same article in an adjoining bin. Then too, the use of more than one location for the same article tends towards the accumulation of shelf-worn or old stock. The most convenient location will invariably be approached first and the more remote one neglected. Such double locations mean that the helpers have more things to remember, and naturally leads to a larger percentage of errors. Stress has been laid on this feature of storing, for my experience has proven it to be prolific of exceptionally bad situations and conditions.

Identifying and Locating Material.—All bins should be numbered, and all tiers should be either lettered or numbered, or both. In fact, all receptacles should

have some identification mark which should be entered on the perpetual inventory as invariably as though it were the address of a customer in the sales ledger. In the illustrations given in Chapter XVII, several schemes are shown. A very good system is the use of metal flags distinctly lettered or numbered attached to the framework of the receptacle.

In all of the illustrations shown it will be noticed that card holders are furnished with the bins. These should unfailingly be utilized for their intended purpose. I have seen men storing small articles in the storeroom approach a bin, extract one of its contents, match it up with the new goods, and then, if superficially they corresponded, dump the new lot in with the old.

No matter what the article it has a name, size, or some distinguishing characteristics, and there should be a place for it properly provided with a distinguishing card. Even the partitioned spaces in the yards should be numbered or identified. If this is not done it is so easy to forget which location contains a certain carload of pig iron, or where some lumber was stored. Hence when it becomes necessary to identify the shipment it cannot be done positively.

Material Returned to Stores.—If for any reason it becomes necessary for the shop to return material to the stores, a credit requisition should accompany it, designating the order on which it applies and any other particulars required by the cost accountant. These instances occur with the curtailing or canceling of orders by the production department.

Some departments may also have a surplus quantity of supplies from time to time. It is far too common a practice to allow these to remain in the department, or to return them to the stores without any memorandum. The result is that they do not get on the records. Insistence is again placed on the absolute necessity of having a receiving memorandum for everything going into the stores. If this is not done, the clerical records surely will not be posted with the entries, and proper credits to the departments or production will not appear in the cost accounts. Figure 101 illustrates a form which can be used for all supplies and raw material returned to stores.

Scrap.—The remarks in the two preceding paragraphs apply with equal force to all scrap. Such

CREDIT REQUISITION		
Material, Supplies or Scrap returned to Stores		
To apply on order no. _____		Date _____
QUANTITY	DESCRIPTION	SIZE OR PATT. NO.
From Dept. No. _____ Foreman _____		
Delivered by _____		Received by _____

FIG 101. CREDIT REQUISITION

Everything sent to the stores from the shop or any department should be accompanied by a form similar to this.

material should pass into the possession of the storekeeper at the earliest convenient opportunity. Some scrap has a very considerable value, and as much attention should be paid to its care as is paid to new raw material, hence the perpetual inventory should show a record of all scrap. It is the practice of some concerns to send scrap to the shipping clerk; but this cannot be recommended, for it should appear in the inventory and it is not always wise to sell at once.

On the receipt of scrap, an advice should be sent to the purchasing agent, for he should have control of the sale as he is best fitted to know the most favorable market and the best time to sell. It is possible that the disposal of scrap might be delayed several weeks or even months, and in the meantime the only proper place for it is the storeroom.

Obsolete material should be treated in a similar manner to scrap, and an advice similar to the form illustrated in Figure 102, should be sent to the purchasing agent. The storekeeper should allocate some portion of his storage space for all scrap and obsolete material, keeping it entirely separate from the new material and in a location where it will not encumber the free movement of the active storage items.

Stationery Stores.—The average business house is more wasteful with stationery than with any form of supplies. The percentage of concerns which keep no records of such stock is extremely high. A great many establishments keep their stationery stock in a cupboard or some similar kind of receptacle, and most of the others keep it in the general office and hand it out on a verbal request.

Date _____		
To the Purchasing Agent:		
The material listed below is now in the stores and is to be sold as early as possible		
Quantity	Material	Condition
Received from Dept. No. _____		
_____ Storekeeper		

FIG. 102. REPORT FROM STOREKEEPER TO PURCHASING AGENT
THAT SCRAP OR OBSOLETE MATERIAL HAS BEEN RECEIVED

The general storekeeper should have charge of all stationery, including pens, pencils, ink, paper fasteners, desk pads, inkstands, carbon paper, and so on. Important savings can be effected by competent control of everything of this nature. Standardized office

furniture should be adopted, and the desks and chairs should be given form numbers. Pencils, paper fasteners, inkstands, etc., should all have form numbers. These are essential for identification and are highly effective in reducing the number of varieties in use.

A copy of every printed form used should be posted on a loose-leaf sheet and fastened in a binder. The sheets should be of such size that the form number and name of form may be written at the top and the purpose of the form and detailed instructions as to its proper use may be written below. Such binders become extremely valuable in educating new employees in the system in use. A duplicate may be kept in the purchasing department and will be found very useful in making purchases. It is easily kept up to date, is always at hand for reference, and the system of the establishment can be studied at any time.

CHAPTER XX

DISTRIBUTION OF MATERIAL FROM STORES

Delivery Problems.—Probably the most important activity in connection with the physical operation of raw material stores, is the delivery or distribution of them to the various applicants. Material may come in in very large quantities and it may go out in very small quantities. Incoming material should be put into the proper receptacles promptly, but it is not so imperative as delivering outgoing material immediately upon the receipt of an application.

With the larger number of operations there is more danger of mistakes. Moreover, the delivery records must be posted promptly so that close track may be kept of the stock. The assistants engaged in this work must be thoroughly conversant with the stock and must be able to make delivery without delay. They must be able to scrutinize requisitions and decide whether they include all the requisite information. They must also see that the requisitions are signed by a forman or other person authorized to order material from the stores.

The question of authority to requisition material is most important. The men empowered to do so should be designated by the general superintendent or some person in authority. Irresponsible persons should

never be given authority to withdraw stores. If the raw material is small in bulk and high in intrinsic value, serious losses might occur. There is or should be, however, complete control in the shop of all material drawn from the stores for production purposes, and any excess or waste should be quickly discovered. But prevention of overdrafts on the stores is better than rectification after mistakes are made.

With all kinds of supplies and small tools, persons without a sense of responsibility could obtain from stores much larger quantities than necessary, as these are more difficult to control, the ultimate use being, in many cases, general and not charged directly to a production order. It is undoubtedly in connection with these that strict supervision is necessary.

Form of Requisitions.—The requisitions or orders on the stores for withdrawing material vary greatly. These variations are caused by differing production methods or cost accounting systems. As far as the operation of the stores is concerned the variations are not of great importance, except that in certain particulars they must conform to stores requirements. The essential features are a clear and unmistakable description of the material, for what purpose it is required, an authorized signature, correct dating, and, possibly, sequential numbering.

These documents do not remain permanently in the storekeeper's possession, but after the proper entries are made in the stores records they pass along to the cost accountant who is more vitally interested in their final disposition and preservation and who

utilizes them in connection with other documents and information in compiling records of costs. It is possible, therefore, that the cost department would desire the requisitions on the stores to be uniform with, or bear some relation to, the other forms they may be using.

Although the actual form used may not be of great importance as long as it embodies certain features, still the provision and delivery of material is important and calls for some elaboration in detail, for the whole of the preceding discussion has been leading up to this function and the fruits of good purchasing and storekeeping should be apparent at this point.

Figure 103 illustrates a form used by the Otis Elevator Company in withdrawing material from stores. These forms are in duplicate, one copy being retained by the stores department and one by the department receiving the material. Another form used for a stock order or jobbing order is illustrated in Figure 104. The latter is really a copy of the shop order and contains a list of the material required in the space designated.

Shortages.—Assuming that the material is in the stores and delivery can be made at once, the operation is simple and the transaction can be quickly closed and disposed. But there are times, and they are increasing in frequency with recent conditions, when only part of the material called for can be delivered. There then exists a shortage, and a “shortage” form like that shown by Figure 105 is issued by the storekeeper.

parent" shortage. This differs from a real shortage because, although the material is requisitioned, it is still in the stores. Sometimes these "apparent" shortages are somewhat difficult to handle in such a way as not to accumulate too much stock and yet have sufficient for current needs.

Several ways may be employed to take care of this condition, and the one used will depend largely on how often the condition occurs and the quantity of material involved. A scheme which has been carried out successfully is to take the material covered by the orders and place it in tote boxes. These boxes are then kept in a section of the storeroom devoted to this purpose and their contents are treated as if already delivered from the stores, although actually still in the storekeeper's possession. Should the amount of material set aside in the tote boxes reach undue proportions, and should the storekeeper consider that he is justified in using part of it for current requirements, the amount needed is extracted and a "shortage" ticket is put in the box. The storekeeper must, of course, know that he can procure the material at short notice to make up the deficit.

If there are a large number of orders calling for deferred delivery, or if it is heavy material which cannot be segregated in tote boxes, it is better to have a supplementary sheet attached to the perpetual inventory, entering on this sheet all items called for by the shop order but not taken from the stores. For example, suppose the inventory shows 5000 units in the stores, but the supplementary memorandum attached to the inventory sheet or card may show that

4000 are, or will shortly be, needed for shop orders. Actually, then, there is only a balance of 1000 available for requisitions which may come in at any moment. As fast as the material is taken from the stores the items on the supplementary sheet must be cancelled and transferred to the permanent inventory. This scheme is recommended, for the storekeeper has a complete record of the quantities actually in the stores and the quantities which will be needed for all production orders as soon as they are issued. In addition, he will know the dates the latter material will be called for, and can determine whether he can safely use part of this and create an "apparent" shortage.

Issuing Stores in Sets or Groups.—There are some articles which can be issued from the stores without the necessity of specifying each item. For instance, in a boiler-making establishment there may be a dozen or even twenty articles kept in the stores which are all standard fittings for a standard boiler. A great deal of time and work can be saved by furnishing the storekeeper with a complete list of the standard set. Then when they are needed, all that is necessary is to make the requisition for one or more sets of the fittings. This saves writing out a list of the twenty items. But before the requisition is sent to the storeroom it is advisable to send word that such a requisition will shortly be presented, so that the storekeeper may gather all the items together and not keep the runner or messenger waiting who goes for the material while it is being brought together for issuance.

Shop Orders and Stores Requisitions.—To show the close relation between shop orders and stores requisitions the illustration shown in Figure 106, used by the Jeffrey Manufacturing Co., is a good example. This form is in three sections. The section of interest to the storekeeper is the bottom one, as it is this that forms the stores requisition and upon which the material is specified.

It is impossible to give illustrations or describe methods which would fit every condition. Industrial establishments are too varied in their nature and characteristics. They all use some articles which, to them, are raw material, although they may have been the finished product of some prior manufacturing process. As far as the operation of the storeroom is concerned, this would not make much difference if the articles or materials entering into a product were all drawn from the stores at one time. But this is not possible in those cases in which a factory is turning out a product composed partly of material which is to undergo prolonged manipulation in the shop and partly of articles on which no work is to be done. The illustration previously given of boilers is an example of this.

Another instance is in manufacturing pianos, the lumber for which might be drawn from stock several weeks or months in advance of the hardware and fittings, such as locks, hinges, castors, and so on. These articles are really the finished product of some other manufacturer, and no additional labor is expended on them, but they are nevertheless raw material to the piano manufacturer. In so far as store-

Board No. _____ S. O. No. _____ Card No. _____ Total Cards _____ DEPT. NO. _____ Cat. No. _____ Date _____ Dwg. No. _____ Mk. _____ The UNIT order calls for the following:				
Material _____ Labor _____ Wanted by _____ Pattern No. _____ Scheduled by _____ Checked in Dept. _____ Deliver to _____ Rec'd by _____ (Limit on back) _____ Clerk _____				
Board No. _____ S. O. No. _____ Card No. _____ Total Cards _____ DEPT. NO. _____ Cat. No. _____ Date _____ Dwg. No. _____ Mk. _____ This card IDENTIFIES material or parts attached as the following:				
Material _____ Labor _____ Stock Condition _____ Stock to be delivered _____ Pattern No. _____ File date _____ in office _____ Checked in Dept. _____ (Moves on back) _____				
Board No. _____ S. O. No. _____ Order Card No. _____ Total Cards _____ DEPT. NO. _____ Cat. No. _____ Material Card No. _____ Total No. _____ Dwg. No. _____ Mk. _____ Date _____ Store _____ To DEPT. NO. _____ Delivery Date _____				
Amt.	Description	Weight	Price	Value
Filled by _____ Clerk _____				

**FIG. 106. SHOP ORDER AND STORES REQUISITION USED BY
JEFFREY MANUFACTURING CO.**

keeping is concerned the problem lies in deferring the storing of them until the factory requires them.

In this example, the manufacturing department after consultation with the sales department, might decide to put an order in the shop to make up one hundred pianos, and would put in hand the necessary castings and draw from the stores the lumber and all material on which labor was to be expended. But it would not be necessary at the same time to requisition for immediate delivery from the storeroom the articles which would be used only in assembling the finished product.

In all cases of this character there must be a close approximation given to the storekeeper of the date on which such finished articles will be required. If this is not done a very large stock would otherwise be on hand many months in advance of actual requirements, which would be detrimental to good storekeeping. The manufacturing department is the sole arbiter in these matters. It has to decide whether all the product is to be assembled on completion of the work in the shop, or only a portion of the quantity being made up. Due advice of this must be given the storekeeper to enable him to arrange his stores to meet these conditions. Practically all matters of this character are taken care of by the planning department, and the accurate operation of the requirements and orders of that department are responsible for this phase of storekeeping.

Supplies from Stores.—All materials and articles drawn from the stores which are in the nature of expense items should be requisitioned on a form differ-

ing from the material used in production work. This covers all material needed for repairs to buildings or equipment, machine repairs and replacements and all general shop supplies.

There should not be any divided authority in connection with the control of supplies and expense items. They should all be under the jurisdiction of the general storekeeper and the use of them defined on the stores requisition. For instance, requisitions for supplies for "general use" should be avoided. The department in which they are to be used should be specified and, whenever possible, the purpose for which they are required. The closer these lines can be drawn the greater will be the saving in this class of overhead expense.

Not only should the control of supplies and expense items be vested in the storekeeper, but he should have authority to determine the maximum and minimum limits. This is a different proposition to that of materials for production work and quite a different point of view is necessary in forming a judgment. The storekeeper is the man best fitted for the work, and he can render important service in its execution.

Stores Records.—The compiling of stores records has been referred to in Chapter XVIII in the discussion of inventories. Practically nothing should be permitted to disorganize the keeping of the records. There must be an advice or document of some kind accompanying all entries to the stores, and requisitions must be obtained for everything leaving the storekeeper's charge. If these are properly safe-

guarded and duly entered on the inventory, there cannot be much wrong with the records.

One of the greatest difficulties is the institution of an infallible system by which material will be ordered when the minimum is reached. The inventory may be absolutely correct in every particular, but the passing of the minimum might not be indicated.

I have previously explained that the minimum is established on the basis of the least quantity that it is safe to carry in stores to meet the rate of consumption, plus the quantity which it is estimated will be consumed during the period required to get delivery—that is, from the time the storekeeper makes a requisition on the purchasing agent until the material arrives in the stores.

It would seem that in posting the entries in the perpetual inventory one could not fail to observe the approach towards the minimum. But the clerks engaged on this work do not always keep the records right up to date, or they do not balance them often enough, or their attention is distracted by other duties. This has given rise to the evolution of some “automatic” form to call attention to the reaching of the minimum.

One method is to have tickets on the bins themselves, which are distinctly marked with the minimum quantity. It is the stockman's duty to note when the quantity in the bin is at the low point and at once advise the storekeeper. The advice can be accomplished by having two tickets, red and white, in the holder on the bin. The outside white ticket is taken from the holder and is forwarded to the store-

keeper. The red ticket is immediately exposed and indicates a condition of danger.

This scheme might be used in certain cases as an aid to the man who is keeping the inventory, but it is only permissible in those cases where the stock can be easily counted. For instance, if the minimum were fixed at 750 articles or units, it is not conceivable that the stockman can count or weigh these every time he thinks the low point is being reached to determine whether he must advise the storekeeper.

Several other forms of bin tickets have been devised, the object of all being to reduce the work on the inventory, or for use as an aid and assistance to the clerks engaged on the work. For example, in those instances where very frequent withdrawals are made from the stores, the bins may be provided with tickets on which the stockman makes an entry each time he takes articles from the bins. When these tickets are filled with entries of deliveries they are sent to the storekeeper who posts the total amount on the card as one item in his perpetual inventory. Such instances, where bin tickets may be used, however, are isolated, and they are more or less makeshifts with the object of relieving the work on the inventory. Now, this work is of prime importance to good storekeeping and it cannot be minimized or slurred. The effectiveness of the inventory is surely going to suffer if attempts are made to substitute some other form of recording receipts and deliveries, or if it is regarded as a burden to keep up and the attempt is made to reduce the burden.

Every consideration of good storekeeping, good

buying, and good cost keeping demands a stores inventory as nearly accurate as it is humanly possible to make it. There must be sufficient clerical help to make the postings on the inventory regularly and as quickly as possible after the delivery requisitions reach the inventory desk. With sufficient clerical assistance there should never be any question of neglecting to send requisitions to the purchasing agent when the minimum is reached.

A very large establishment employing twelve clerks posting entries on the stores inventory cease this work every day at four o'clock. The next hour is devoted to writing requisitions for all material on which the minimum has been reached or which is special. This method of procedure could not be maintained if requisitions were not posted promptly every day, every hour, and almost every minute. This is the only way correct inventories can be kept. If the requisitions were allowed to accumulate, chaos would reign; and at a late hour or even the next day a hurried attempt to catch up with the work would mean that the observance of the minimum would be neglected and requisitions on the purchasing agent for new material would be delayed.

Stores Requisitions on the Purchasing Agent.—Attention is drawn to Figure 35 on page 230. This is the storekeeper's requisition on the purchasing agent to buy, and complete information is given at the foot of the monthly consumption. The figures for each month are taken from the back of the perpetual inventory, Figure 94, where the records are kept. These requisitions are written up by the clerks who

post the entries in the inventory. They fill in all the particulars noted in the various spaces, sign the requisitions and pass them along to the head storekeeper. After his signature is affixed, they pass to the purchasing agent, being in his hands at the opening of the office the following morning. Many storekeepers make a practice of drawing requisitions once a month for a large part of their requirements. This may be done with some supplies, but should not be followed in the case of articles and materials for use in production work; if it is, some of the finer points connected with the economics of storing must be sacrificed.

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